CCD-F370E

SERVICE MANUAL

AEP Model
UK Model

SONY
SONY
Handycam
AF

Handycam
Video 8
U MECHANISM

CCD-F370E is a gray type model of CCD-F380E.
In this service manual, only the differences between CCD-F370E and CCD-F380E are mentioned.
When servicing, see the CCD-F380E service manual (9-972-878-11) with this manual.

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 20.051 mm/sec. LP: Approx. 10.058 mm/sec.
Recording/playback time	SP mode: 1 hour 30 min (P5 – 90) LP mode: 3 hours (P5 – 90)
Fast forward/rewind time	Approx. 6.5 min. (P5 – 90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 × power zoom lens f=8.5 – 68 mm, F1.6 with macro Filter diameter: 46 mm
Auto focus system	TTL
Colour temperature	AUTO HOLD INDOOR 3,200 K OUTDOOR 5,800 K
Minimum illumination	4 lux
Illumination range	4 lux–100,000 lux (0.4 – 9,294 footcandles)
Recommended illumination	More than 300 lux (28 footcandles)
Aperture correction	Automatic Back light adjustment

– Continued on next page –

MICROFILM

8 VIDEO CAMERA RECORDER
SONY®

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced, sync negative
Audio output	Phono jack, –7.5 dBs, at output impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5 V DC
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo mini-minijack
MIC jack	Minijack, –66 dBs, low impedance With 2.5 – 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

General

Power requirements	On battery mounting surface 6.0 V (battery pack)/7.5 V (AC power adaptor)/9.0 V (alkaline batteries)
Power consumption	6.9 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C
Storage temperature	–20°C to +60°C
Dimensions	Approx. 122 × 153 × 317 mm (w/h/d) including lens hood
Weight	Approx. 1.2 kg excluding the battery and cassette
Microphone	Electret condenser microphone, omni-directional monaural type

Supplied accessories
- Battery pack NP-66 (1)
- AC power adaptor AC-V35 (1)
- RFU adaptor RFU-90E (1) or RFU-89EA (1) With the RFU-89EA, an aerial selector and a screwdriver are supplied.
  - (RFU-90E .... AEP model
  - RFU-89EA .... UK model)
- Shoulder strap (1)
- Lithium battery CR2025 (1)
- Lens cap (1)

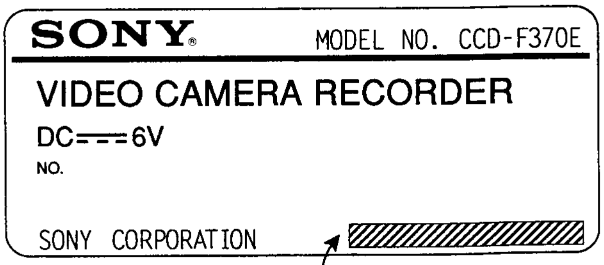
Design and specifications are subject to change without notice.

CAUTION

1. In this unit, A or B type EVF is uesd.

Type A	Color of connecting harness (VF-21) which connectes EVF and CV-9 board is gray. (VF-14p board)
Type B	Color of connecting harness (VF-21) is white. (VF-22p board)

2. There are differences between the electrical and mechanical parts of the TYPE 1 and TYPE 2 of AEP model. Refer to the following Model number label for identifying.



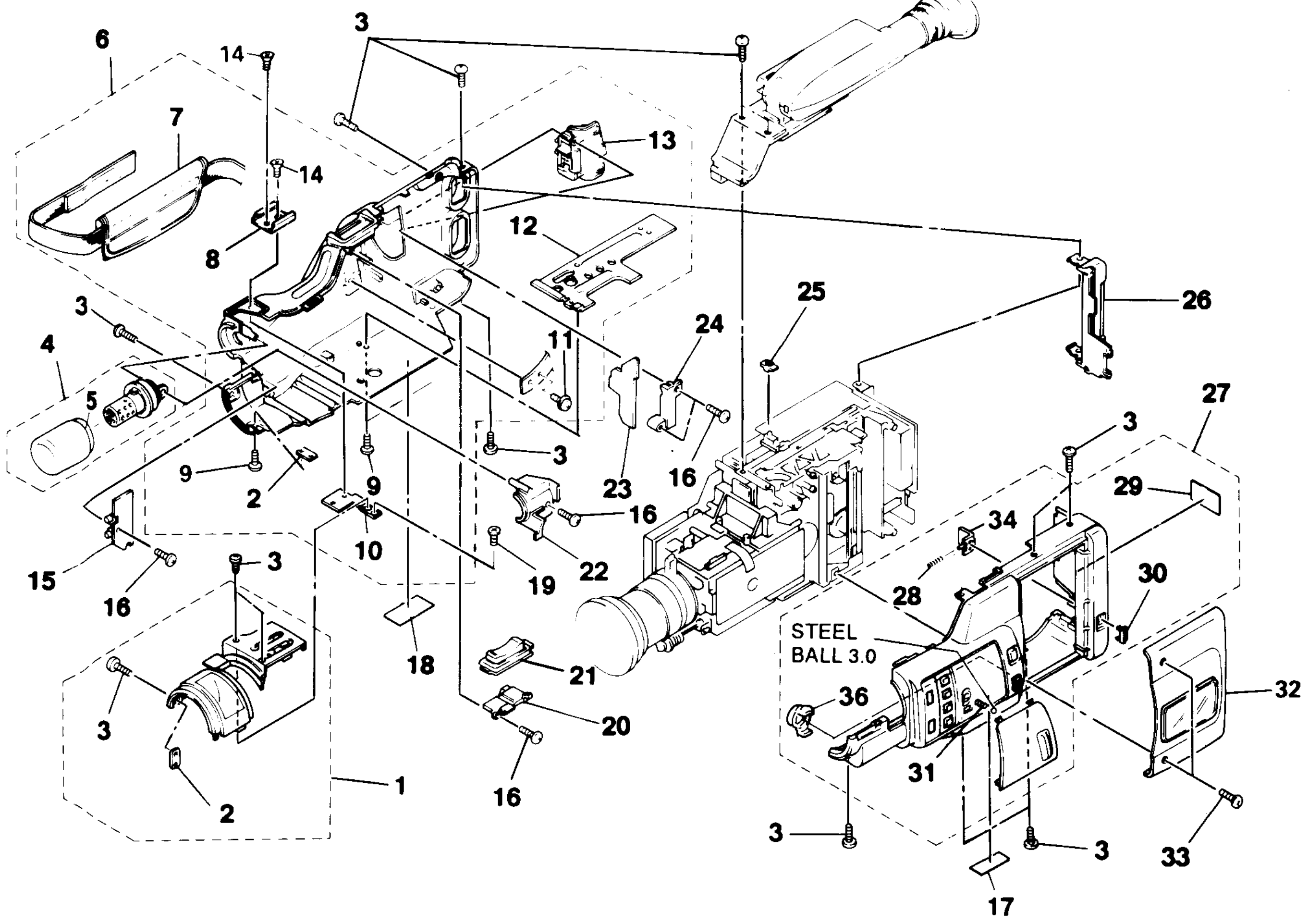
TYPE1: MADE IN JAPAN
TYPE2: MADE IN FRANCE

SECTION 1
EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

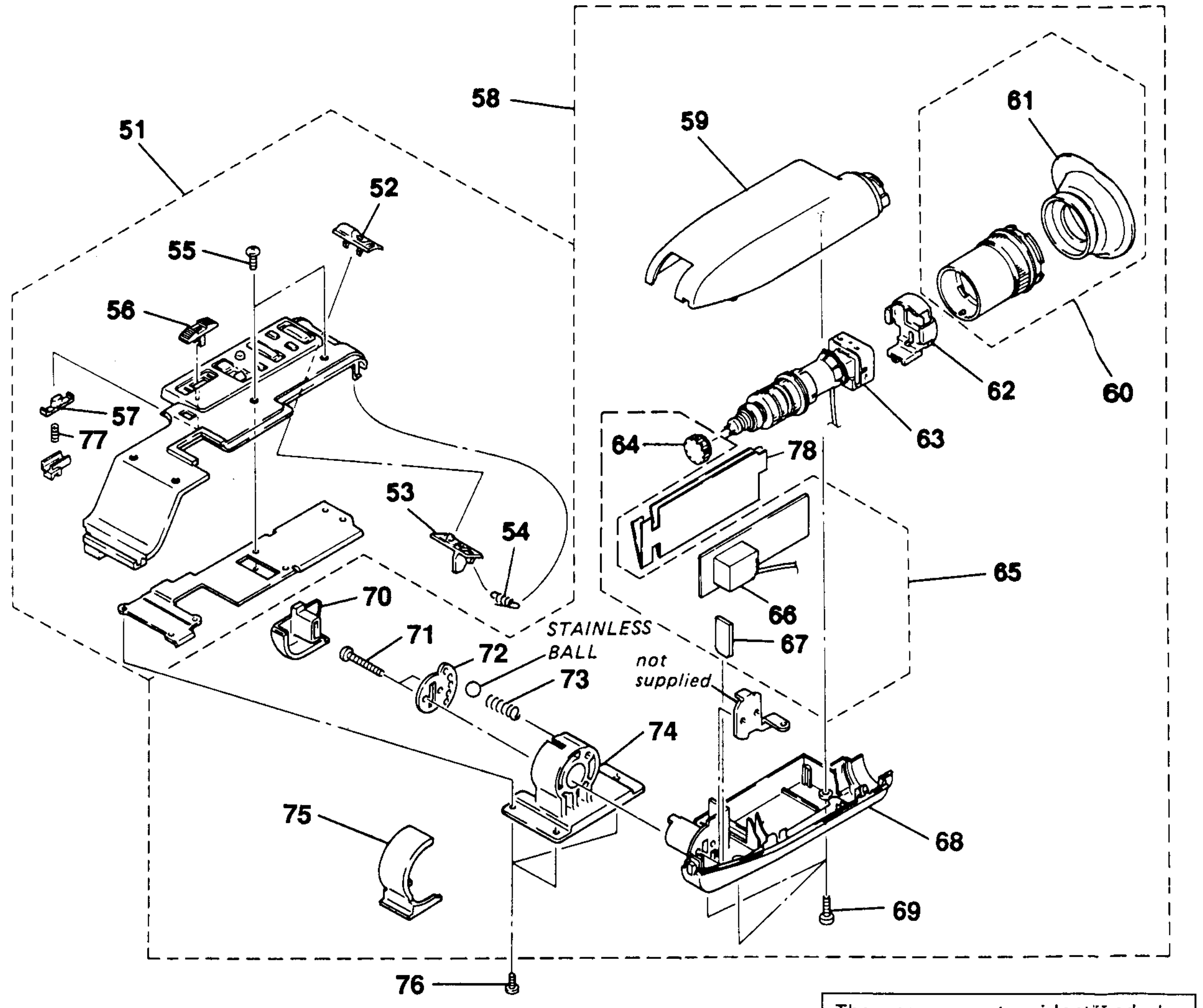
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

1-1. CABINET (R, L) ASSEMBLY



No.	Part No.	Description	Remark
1	X-3733-946-1	CABINET (FRONT) ASSY	2-3
2	3-732-912-01	JOINT, L/R	
3	3-719-381-01	SCREW (M2X4)	
4	1-542-125-21	MICROPHONE (C-2027)	5
5	3-707-650-11	SCREEN, WIND	
6	X-3737-751-1	CABINET (LEFT) ASSY	2, 7-14
7	3-719-323-01	BELT, GRIP	
8	3-724-511-01	SHOE, ACCESSORY	
9	3-719-381-31	SCREW (M2X3)	
10	3-737-723-01	RETAINER, SHOE	
11	3-669-480-21	+ PTPWH 2	
12	*3-732-911-01	SHEET METAL, TRIPOD	
13	X-3733-948-1	KNOB ASSY, SP	
14	3-719-831-21	SCREW (M2X4)	
15	*A-7061-958-A	MA-37P BOARD, COMPLETE	
16	3-713-790-31	SCREW (M2X8), TAPPING, P3	
17	*3-704-235-01	LABEL, CAUTION (UK MODEL)	
18	*3-746-832-01	LABEL, MODEL NUMBER (AE) (AEP(TYPE 1))	
	*3-741-585-01	LABEL, MODEL NUMBER (AE) (AEP(TYPE 2))	
	*3-746-833-01	LABEL, MODEL NUMBER (UK) (UK)	
19	3-713-790-01	SCREW (M2X6), TAPPING, P3	
20	*3-732-937-01	RETAINER, ZOOM BUTTON	
21	1-571-837-11	SWITCH, PUSH (ZOOM SW) (S901)	
22	3-737-737-11	HOUSING, MICROPHONE	
23	*1-631-831-21	RC-29P BOARD	
24	*3-732-928-01	STOPPER, RC	
25	3-732-926-01	BUTTON, EDIT	
26	3-732-924-31	BLIND, L/R	
27	X-3737-770-1	CABINET (RIGHT) ASSY	28-31
28	3-426-508-00	SPRING, COMPRESSION	
29	*3-719-683-01	LABEL, BATTERY FITTING	
30	3-732-905-01	BUTTON, BATTERY RELEASE	
31	3-576-098-00	SPRING, COMPRESSION	
32	X-3737-736-1	LID ASSY, CASSETTE	
33	3-733-912-01	SCREW (M2X2.5), SPECIAL HEAD	

1-2. CABINET (UPPER), EVF ASSEMBLY (TYPE A)

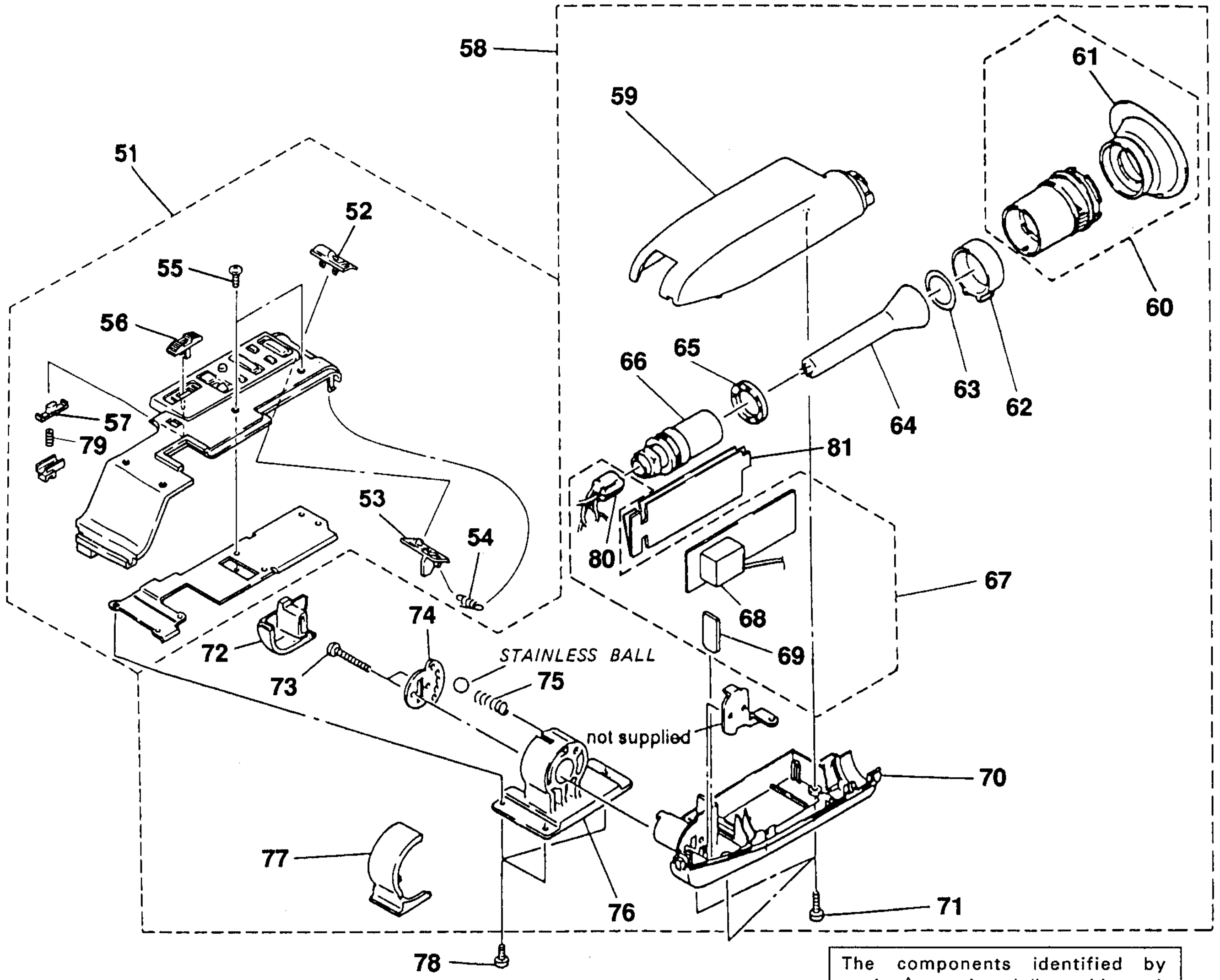


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

****(A TYPE)****

No.	Part No.	Description	Remark
51	X-3737-752-1	CABINET (UPPER) ASSY	52-57, 77
52	3-732-919-01	BUTTON, EJECT	
53	3-732-920-01	LOCK, EJECT	
54	3-669-440-00	SPRING, TENSION	
55	3-719-381-01	SCREW (M2X4)	
56	3-718-226-01	BUTTON, POWER	
57	*3-718-257-11	BUTTON, PUSH, POWER	
58	*A-7019-220-A	EVF COMPLETE ASSY (TYPE A)	59-76
59	3-732-948-51	CABINET (UPPER), EVF	
60	A-7081-148-A	HOLDER BLOCK ASSY, FINDER	61
61	3-733-922-01	EYE CUP	
62	X-3732-910-1	HOLDER ASSY, CRT (TYPE A)	
63	.1-452-482-11	CRT ASSY (M01JYZ60WB) (TYPE A)	
64	1-540-019-21	SOCKET ASSY, CRT (W901) (TYPE A)	
65	*A-7061-609-A	VF-14P BOARD, COMPLETE (TYPE A)	64, 66, 67
66	.1-439-431-11	TRANSFORMER ASSY, FLYBACK (T901)(TYPE A)	
67	*1-629-384-21	LD-13P BOARD (TYPE A)	
68	X-3737-722-1	CABINET (LOWER) ASSY, EVF	
69	3-713-790-31	SCREW (M2X8), TAPPING, P3	
70	3-732-949-31	BLIND, EVF CABINET (LOWER)	
71	3-732-987-01	SCREW (M2X20), +P	
72	3-732-947-01	PLATE, LOCK	
73	3-732-946-01	SPRING, COMPRESSION	
74	*3-732-944-11	BEARING, EVF	
75	3-732-950-31	BLIND, EVF	
76	3-732-988-01	SCREW (M2X2.5)	
77	3-303-973-00	SPRING, COMPRESSION	
78	*3-733-914-01	INSULATOR, EVF	

1-3. CABINET (UPPER), EVF ASSEMBLY (TYPE B)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

****(B TYPE)****

No.	Part No.	Description	Remark
51	X-3737-752-1	CABINET (UPPER) ASSY	52-57, 79
52	3-732-919-01	BUTTON, EJECT	
53	3-732-920-01	LOCK, EJECT	
54	3-669-440-00	SPRING, TENSION	
55	3-719-381-01	SCREW (M2X4)	
56	3-718-226-01	BUTTON, POWER	
57	*3-718-257-11	BUTTON, PUSH, POWER	
58	A-7019-221-A	EVF COMPLETE ASSY (TYPE B)	59-77, 80, 81
59	3-732-948-51	CABINET (UPPER), EVF	
60	A-7081-148-A	HOLDER BLOCK ASSY, FINDER	61
61	3-733-922-01	EYE CUP	
62	X-3724-509-1	HOLDER ASSY, CRT (TYPE B)	
63	3-724-570-01	RING, CRT FIXED (TYPE B)	
64	.1-546-085-11	CATHODE-RAY TUBE, B/W (M01KGG007WB) (TYPE B)	
65	3-724-549-01	LOCK, CRT (TYPE B)	
66	.1-451-310-21	DEFLECTION YOKE (B/W) (TYPE B)	
67	*A-7062-012-A	VF-22P BOARD, COMPLETE (TYPE B)	68, 69, 80
68	.1-439-428-11	TRANSFORMER ASSY, FLYBACK (T901)(TYPE B)	
69	*1-630-067-21	LD-17P BOARD (TYPE B)	
70	X-3737-722-1	CABINET (LOWER) ASSY, EVF	
71	3-713-790-31	SCREW (M2X8), TAPPING, P3	
72	3-732-949-31	BLIND, EVF CABINET (LOWER)	
73	3-732-987-01	SCREW (M2X20), +P	
74	3-732-947-01	PLATE, LOCK	
75	3-732-946-01	SPRING, COMPRESSION	
76	*3-732-944-11	BEARING, EVF	
77	3-732-950-31	BLIND, EVF	
78	3-732-988-01	SCREW (M2X2.5)	
79	3-303-973-00	SPRING, COMPRESSION	
80	⚠.1-526-978-21	SOCKET ASSY, CRT (CRT-901)	
81	3-733-914-01	INSULATOR, EVF	

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
*3-340-514-01	BAG, PROTECTION	
*3-732-952-01	CUSHION (UPPER)	
*3-732-953-01	CUSHION (LOWER)	
3-752-081-11	MANUAL, INSTRUCTION (English)	
3-752-081-41	MANUAL, INSTRUCTION (AEP MODEL) (French, German, Spanish)	
3-752-081-51	MANUAL, INSTRUCTION (AEP MODEL) (Dutch, Swedish, Italian)	
3-751-798-61	MANUAL, INSTRUCTION (AEP) (Portuguese)	
*3-764-631-12	INSTRUCTION, DEW CONDENSATION (AEP)	

**** ACCESSORIES AND PACKING MATERIALS (KIT) ****

Part No.	Description
A-6767-707-A	RFU ADAPTOR (RFU-89EA) (UK)
A-6768-254-A	RFU ADAPTOR (RFU-90E) (AEP)
1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE) (UK)
3-712-673-01	SCREWDRIVER (UK)
*3-741-532-01	CUSHION, ACC
3-741-582-01	BELT, SHOULDER
*3-733-975-31	INDIVIDUAL CARTON (AEP(TYPE 2))
*3-746-806-21	INDIVIDUAL CARTON (AEP(TYPE 1), UK)
** AC-V35	AC POWER ADAPTOR
*** NP-66	RECHARGEBLE BATTERY

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

****

HARDWARE LIST
****

SCREW

Part No.	Description
7-621-281-15	SCREW +P 2X2
7-627-553-37	PRECISION SCREW +P 2X3 TYPE 3
7-627-553-48	PRECISION SCREW +P 2X4 TYPE 3

STEEL BALL

Part No.	Description
7-671-155-01	STEEL BALL 3.0
7-671-156-01	BALL, STAINLESS

****

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CCD-F380E

SERVICE MANUAL

AEP Model
UK Model
E Model
Australian Model

SONY
SONY
Handycam
Video8
AF
CCD
8x

Handycam
Video 8

U MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅲ" (9-972-732-11).

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 20.051 mm/sec. LP: Approx. 10.058 mm/sec.
Recording/playback time	SP mode: 1 hour 30 min (P5-90) LP mode: 3 hours (P5-90)
Fast forward/rewind time	Approx. 6.5 min. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 × power zoom lens f = 8.5-68 mm, F1.6 with macro Filter diameter: 46 mm
Auto focus system	TTL
Colour temperature	AUTO HOLD INDOOR 3,200 K OUTDOOR 5,800 K
Minimum illumination	4 lux
Illumination range	4 lux–100,000 lux (0.4-9,294 footcandles)
Recommended illumination	More than 300 lux (28 footcandles)
Aperture correction	Automatic Back light adjustment

– Continued on next page –

MICROFILM

8 VIDEO CAMERA RECORDER

SONY®

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced, sync negative
Audio output	Phono jack, –7.5 dBs, at output impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5 V DC
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo mini-minijack
MIC jack	Minijack, –66 dBs, low impedance With 2.5–3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

Display in the viewfinder

Mode and caution indicators
Caution: ⊗ / ⏏ / ▣ / ⊠ / ⧄
Mode: REC/STBY/PAUSE/
▶, ◀ (Editsearch)/
⊜/⊜/STILL/PLAY/
▶▶/◀◀/SLOW/❚❚▶
SP/LP mode, FOCUS, ▧ ,
WHITE BALANCE, ZERO
MEM, shutter speed, title
colour, title scroll mode,
title reverse mode, date, time,
tape counter
Recording/battery lamp

General

Power requirements	Battery compartment 6.0 V (battery pack)/7.5 V (AC power adaptor)/9.0 V (alkaline batteries)
Power consumption	6.9 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 122 × 153 × 317 mm (w/h/d) (4⅞ × 6⅛ × 12½ in.) including lens hood
Weight	Approx. 1.2 kg (2 lb 10 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, omni-directional monaural type
Supplied accessories	• Battery pack NP-66H (1) • AC power adaptor AC-V30 (1) • RFU adaptor RFU-89EA/ASA (1) • Aerial selector (1) • Screwdriver (with the RFU-89EA only) (1) • Shoulder strap (1) • Lithium battery CR2025 (1) • Lens cap (1)

Design and specifications are subject to change without notice.

Note
This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

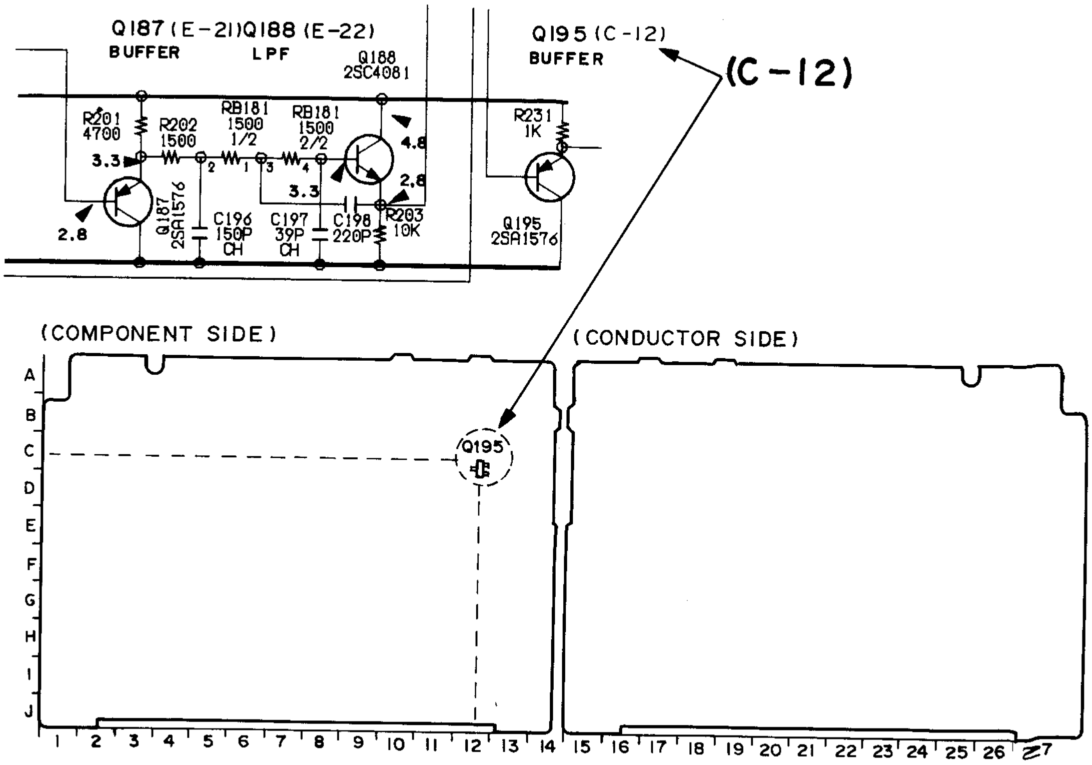
1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistors, diodes) are indicated in red sa shown below. This enable to find the location on the board easily when servicing.


Q187 (E-21) Q188 (E-22)
BUFFER
LPF
Q188
2SC4081
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
2.8
4.8
2.8
3.3
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195 (C-12)
BUFFER
R231
1K
Q195
2SA1576
(C-12)
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
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C
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11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27

TABLE OF CONTENTS

Section Title Page

1. GENERAL

Location and Function of Parts and Controls 7
Power Sources 9
Selection of the Automatic or Manual Adjustments 11
Easy Camera Recording wiith Automatic Adjustment 12
Manual Focusing 14
Manual White Balance Adjustment 15
Back Light Adjustment $\boxed{1}$ 16
Shutter Speed Adjustment 16
Recording Data or Time 17
Recording a Title 18
Use of the Tape Counter 21
Trouble Indicators 21

2. DISASSEMBLY

2-1. Removal of Cassette Lid Assembly 22
2-2. Removal of Cabinet (Front) Assembly 22
2-3. Removal of Cabinet (Right) Assembly 23
2-4. Removal of Cabinet (Left) Assembly 23
2-5. Removal of Microphone 24
2-6. Removal of Cabinet (Upper) Assembly and EVF 24
2-7. Opening the CK/LI Assembly 25
2-8. Opening the PS-225P, CV-9 Boards, and Removal of PJ-20 Board 25
2-9. Separating the Camera and VTR Block 26
2-10. Opening the CO-2P and VK-3P Boards 26
2-11. Removl of Cassette Compatment Assembly 26
2-12. Internal View 27

3. DIAGRAMS

3-1. Circuit Boards Location 28
3-2. Overall Block Diagram 29
3-3. Camera Block Diagram 34
3-4. Auto Focus Block Diagram 39
3-5. Digital Title Block Diagram 42
3-6. Video Block Diagram (1) 45
3-7. Video Block Diagram (2) 50
3-8. Servo, System Control Block Diagram 53

Section Title Page

3-9. System Control Section Function Description 57
  3-9-1. Mode/Mechanism Control Microcomputer CXP80116 (IC501 on CO-2P Board) 57
  3-9-2. DDS Microcomputer μPD7508BGB (IC651 on DK-4P Board) 58
  3-9-3. EVR Microcomputer MC68HC05N4FU (IC601 on CV-9 Board) 58
  3-9-4. AF Microcomputer MC68HC05C4FU (IC802 on CV-9 Board) 59
  3-9-5. Mode/Mechanism Control — Video, Audio Block Interface 60
  3-9-6. Mode/Mechanism Control — Servo Peraipheral Circuit Interface 61
  3-9-7. Mode/Mechanism Control — Mode/Mechanism Control Peripheral Circuit Interface 63
  3-9-8. Mode/Mechanism Control — Mechanism Block Interface 65
  3-9-9. DDS Microcomputer (IC651 on CK-8P Board) — Peripheral Circuit Interface 66
  3-9-10. EVR Microcomputer (IC601 on CV-9 Board) — Peripheral Circuit Interface 67
  3-9-11. AF Microcomputer (IC802 on CV-9 Board) — Peripheral Circuit Interface 68
3-10. Audio Block Diagram 70
3-11. View Finder Block Diagram (Type A) 73
3-12. View Finder Block Diagram (Type B) 75
3-13. Power Block Diagram 77

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. Frame Schematic Diagram 81
4-2. Printed Wiring Boards and Schematic Diagrams 83
  - CD-17P Board 83
  - CV-9 (Camera) Board 90
  - CV-9 (Video) Board 108
  - LI-10, CK-19P, DK-4P Boards 119
  - CO-2P (Video/Audio) Board 127
  - CO-2P (Servo, System Control), CC-26P, KS-6P FP-89, FP-90 Boards 135
  - MA-37P, RC-29P, VK-3P Boards 144
  - PJ-20 Board 149
  - VF-14P, LD-13P Boards 153
  - VF-22P, LD-17P Boards 157
  - PS-225P Board 161
  - DT-79D Board 166
  - DT-79A Board 169
  - MX-7P Board 172
4-3. Semiconductors 174

Section Title Page

5. EXPLODED VIEWS

5-1. Cabinet (R, L) Assembly 175
5-2. Cabinet (Upper), EVF Assembly (Type A) 176
5-3. Cabinet (Upper), EVF Assembly (Type B) 177
5-4. Camera and Main Board Assembly 178
5-5. MD Block Assembly (1) 179
5-6. MD Block Assembly (2) 180
5-7. MD Block Assembly (3) 181
5-8. Lens Block Assembly 182

6. ELECTRICAL PARTS LIST 183

HARDWARE LIST 207

7. CAMERA ADJUSTMENTS

7-1. Pre-adjustment Preparations (Camera Block) 208
7-1-1. List of Servicing Jigs 208
7-1-2. Preparations 209
7-1-3. Precautions 210
7-1-4. Adjustment Remote Controller 211
7-1-5. Check Point Array 216
7-1-6. AF Microcomputer Data Reading Jig 216
7-1-7. Data Processing 217
7-2. Camera System Adjustment 218
7-2-1. Flange Back Adjustment 218
7-2-2. 15V Power Adjustment (PS-225P Board) 219
7-2-3. Power Supply Check (PS-225P Board) 219
7-2-4. EVR Initial Settings 219
7-2-5. PLL Adjustment 220
7-2-6. V SUB Adjustment (CV-9 Board) 220
7-2-7. Hall Adjustment (CV-9 Board) 220
7-2-8. Iris Adjustment (CV-9 Board) 221
7-2-9. Iris In/Out Adjustment (CV-9 Board) 221
7-2-10. AGC Adjustment (CV-9 Board) 222
7-2-11. Y Signal Matrix Adjustment (CV-9 Board) 222
7-2-12. Chroma Signal Matrix Adjustment (1) (CV-9 Board) 223
7-2-13. Chroma Signal Matrix Adjustment (2) (CV-9 Board) 223
7-2-14. YH Level Adjustment (CV-9 Board) 224
7-2-15. Sync Level Adjustment (CV-9 Board) 224
7-2-16. Setup Adjustment (CV-9 Board) 224
7-2-17. Y Level Adjustment (CV-9 Board) 225
7-2-18. White Clip Adjustment (CV-9 Board) 225
7-2-19. Aperture Adjustment (CV-9 Board) 226
7-2-20. Max. Gain Adjustment (CV-9 Board) 226
7-2-21. Chroma Level Adjustment (CV-9 Board) 227
7-2-22. Indoor White Balance Adjustment (Method Using Vectorscope) 227
7-2-23. Indoor White Balance Adjustment (Method Using Oscilloscope) (CV-9 Board) 228
7-2-24. Burst Phase Adjustmrnt (Method Using Vectorscope) 228
7-2-25. Burst Phase Adjustment (CV-9 Board) (Method Using Oscilloscope) 229
7-2-26. Burst Level Adjustment (CV-9 Board) 229
7-2-27. Color Reproduction Adjustment (Method Using Vectorscope) 230
7-2-28. Color Reproduction Adjustment (Method Using Oscilloscope) 230
7-2-29. Auto White Balance Adjustment 231
7-2-30. Outdoor White Balance Confirmation (CV-9 Board) 234
7-2-31. Focus Motor Speed Adjustment (CV-9 Board) 234
7-2-32. Macro Area Adjustment (CV-9 Board) 235
7-2-33. Auto-Focus LLA Adjustment (CV-9 Board) 235
7-2-34. Auto-Focus Adjustment 235
7-2-35. Auto-Focus Confirmation 237
7-3. Digital Titler System Adjustment 237
7-3-1. Titler PLL Adjustment (LI-10 Board) 237
7-3-2. Title A/D Level Adjustment (LI-10 Board) 238
7-3-3. Title Pedestal Adjustment (CV-9 Board) 238
7-3-4. Title Y-level Adjustment (CV-9 Board) 239
7-4. Electronic Viewfinder System Adjustment (Type A) (VF-14P Board) 239
7-4-1. Horizontal Tilt Adjustment 239
7-4-2. Centering Adjustment 240
7-4-3. Focus Adjustment 240
7-4-4. Aberration Adjustment 240
7-4-5. Horizontal Oscillation Frequency Adjustment 240
7-4-6. Horizontal Amplitude Adjustment 241
7-4-7. Vertical Amplitude Adjustment 241
7-4-8. Brightness, Contrast Adjustments 242
7-4-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks 242
7-5. Electronic Viewfinder System Adjustment (Type B) (VF-22P Board) 242
7-5-1. Horizontal Tilt Adjustment 242
7-5-2. Centering Adjustment 243
7-5-3. AFC Adjustment 243
7-5-4. Horizontal Amplitude Adjustment 243
7-5-5. Vertical Amplitude Adjustment 244
7-5-6. Focus Adjustment 244
7-5-7. Brightness, Contrast Adjustments 244
7-6. Adjustment Elements Location 246

8. MECHANISM BLOCK ADJUSTMENTS

Refer to the separate "8 mm Video Mechanical Adjustment Manual III (U Mechanism)" for adjustment and checking of the mechanism block and for replacement of mechanical parts.

8-1. Track Shift Mode Setting 251
8-2. Preparation for Adjustment 251

Section Title Page

9. VIDEO BLOCK ADJUSTMENTS

9-1. Power Supply Adjustments and Checks ········· 255
9-1-1. Oscillation Frequency Adjustment (PS-225P Board) ········· 255
9-1-2. Video 5V Adjustment (PS-225P Board) ········· 255
9-2. System Control Adjustments ········· 256
9-2-1. Battery Down Adjustment (CO-2P Board) ········· 256
9-2-2. System Clock Adjustment (CK-19P Board) ········· 256
9-2-3. Clock Precision Adjustment (CK-19P Board) ········· 256
9-3. Servo System Adjustments ········· 257
9-3-1. Oscillation Frequency Adjustment (CO-2P Board) ········· 257
9-3-2. REC ATF Level Checking (CO-2P Board) ········· 257
9-3-3. Switching Position Adjustment (CO-2P Board) ········· 257
9-3-4. Still Adjustment (CV-9 Board) ········· 258
9-3-5. Capstan FG Adjustment (CO-2P Board) (E, Australian Model only) ········· 258
9-4. Video Block Adjustment ········· 258
9-4-1. Playback Frequency Characteristics Adjustment (CO-2P Board) ········· 259
9-4-2. Flying Erase Check (CO-2P Board) ········· 259
9-4-3. Crystal Oscillator fo Checking (CV-9 Board) ········· 259
9-4-4. Y/C Separation Adjustment (CV-9 Board) ········· 260
9-4-5. IR2 Adjustment (CV-9 Board) ········· 260
9-4-6. SYNC AGC Adjustment (CV-9 Board) ········· 260
9-4-7. Emphasis Input Level Adjustment (CV-9 Board) ········· 261
9-4-8. PB Y Level Adjustment (CV-9 Board) ········· 261
9-4-9. PB Video out Level Adjustment (CV-9P Board) ········· 261
9-4-10. Y FM Carrier Frequency Adjustment (CV-9 Board) ········· 261
9-4-11. Y FM Deviation Adjustment (CV-9 Board) ········· 262
9-4-12. Chroma Emphasis fo Adjustment (CV-9 Board) ········· 262
9-4-13. REC Y Level Adjustment (CV-9 Board) ········· 262
9-4-14. REC C Level Adjustment (CV-9 Board) ········· 263
9-4-15. Feedback Chroma Adjustment (PJ-20 Board) ········· 263
9-4-16. Quasi Burst Phase Adjustment (PJ-20 Board) ········· 263
9-4-17. Delay Burst Phase Adjustment (PJ-20 Board) ········· 264
9-4-18. DDS Character Position Adjustment (CV-9 Board) ········· 264
9-4-19. Character Generator fo Adjustment (CV-9 Board) ········· 264
9-5. Audio System Adjustment ········· 265
9-5-1. AFM Carrier Frequency Check (CO-2P Board) ········· 265
9-5-2. REC AFM Carrier Level Adjustment (CO-2P Board) ········· 265
9-5-3. Playback Level Check ········· 265
9-5-4. E-E Output Level Check ········· 266
9-5-5. Overall Level Characteristics Check ········· 266
9-5-6. Overall Frequency Characteristics Check ········· 266
9-5-7. Overall Distortion Check ········· 266
9-5-8. Overall Noise Level Check ········· 266

9-6. Adjustment Elements Location ········· 268

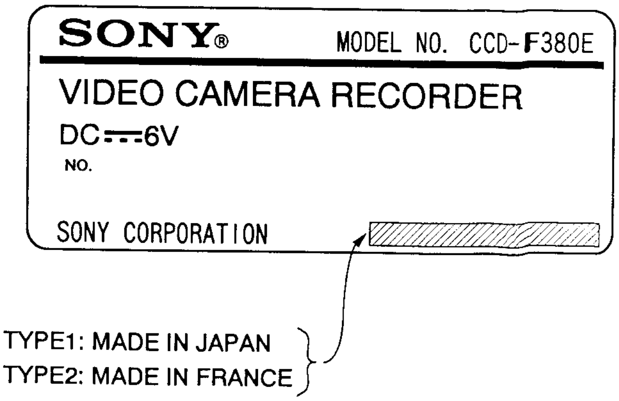
The color reproduction standard frame is contained after the adjustment element location of camera adjustment parts.

CAUTION

1. In this unit, A or B type EVF is used.

Type A	Color of connecting harness (VF-21) which connectes EVF and CV-8 board is gray. (VF-14P board)
Type B	Color of connecting harness (VF-21) is white. (VF-22P board)

2. There are differences between the electrical and mechanical parts of the TYPE 1 and TYPE 2 of AEP model. Refer to the following Model number label for identifying.



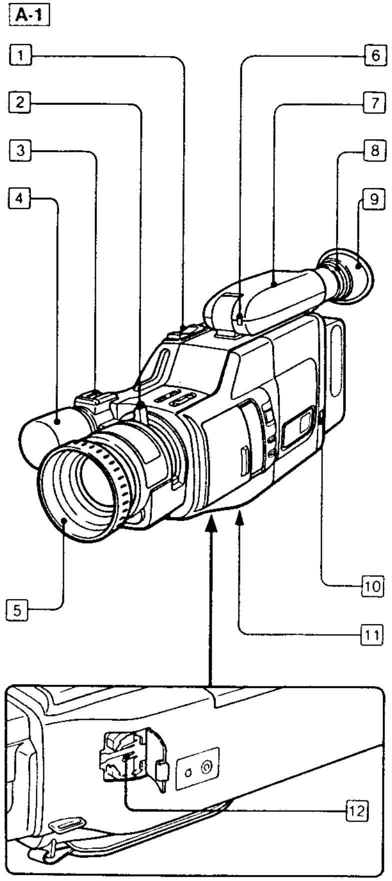
SONY® MODEL NO. CCD-F380E
VIDEO CAMERA RECORDER
DC 6V
NO.
SONY CORPORATION

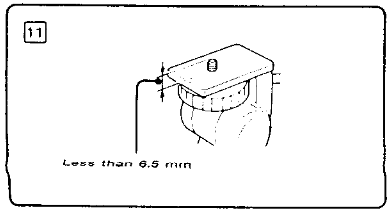
TYPE1: MADE IN JAPAN
TYPE2: MADE IN FRANCE

SECTION 1
GENERAL

Location and Function of Parts and Controls

A-1





For details on the use of each control, refer to the pages indicated in the circle.

A-1

1 **Power zoom button**

2 **Zoom lever and macro button**

3 **Accessory shoe**
Attach an external microphone, video light, etc.

4 **Built-in microphone (monaural)**

5 **Lens hood**
Also functions as focus ring.

6 **Camera recording/battery lamp**
Lights during camera recording. It blinks when the battery is exhausted.

7 **Viewfinder ⑱**
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.

8 **Viewfinder lens adjustment ring**
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

9 **Eyecup**

10 **BATT (battery eject) knob ⑨**

11 **Tripod receptacle (bottom)**

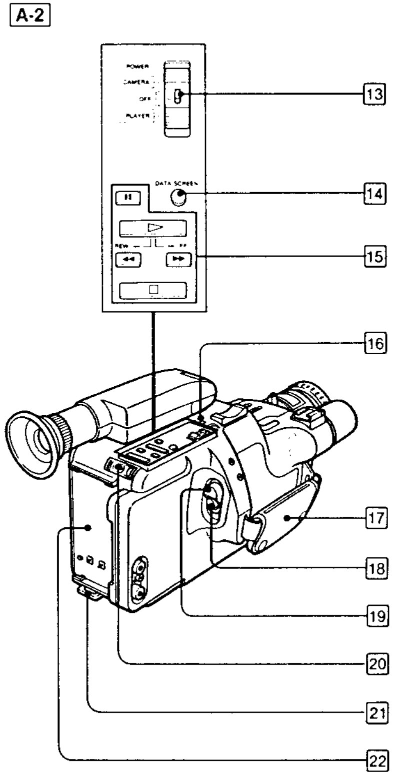
12 **Lithium battery compartment ⑫**

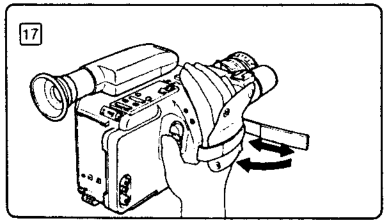
Note when attaching a tripod not manufactured by Sony
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm.
Otherwise the screw may damage the inner parts of the camera.

This section is extracted from instruction manual of AEP, UK models.

Location and Function of Parts and Controls

A-2





A-2

13 **POWER switch**
CAMERA: For camera recording
PLAYER: For playing back or editing tapes
OFF: Power off

14 **DATA SCREEN button**
Press to display the indication on the viewfinder screen on the TV.

15 **Tape transport buttons**
▷ (playback)
►► FF (fast forward)
◄◄ REW (rewind)
□ (stop)
❚❚ (pause)

16 **REC MODE (recording mode)/EDIT switch ⑯**
Switch it depending on the operating mode.

Mode	Recording	Playback	Editing
Setting	REC MODE └SP LP	EDIT (off)	EDIT (on)
Function	Recording mode switch	EDIT switch	

17 **Grip strap**
Adjust the length so that your thumb can easily manipulate the START/STOP button.

18 **START/STOP button**
Press to start and stop camera recording.

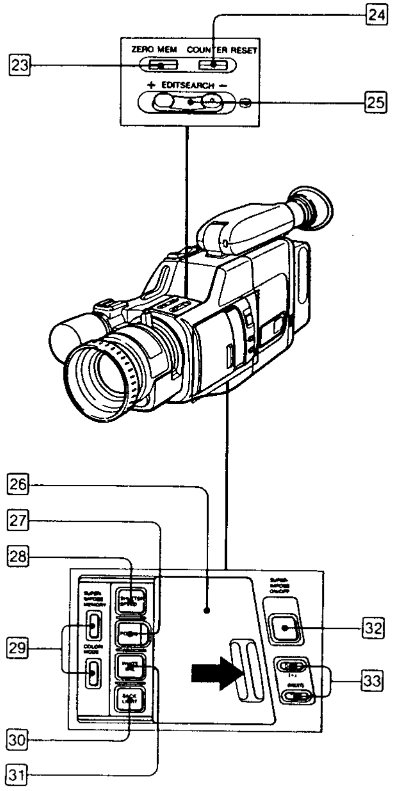
19 **STANDBY switch**
Slide up to STANDBY to set the unit to recording pause mode.

20 **EJECT (cassette eject) button**

21 **Hook for shoulder strap**
Attach a shoulder strap.

22 **Battery mounting surface**

A-3



Location and Function of Parts and Controls

A-3

23 **ZERO MEM (zero memory) button**
Used to memorize the counter zero point.

24 **COUNTER RESET button**
Press to reset the counter to zero.

25 **EDITSEARCH (and recording review) button** ⓳

26 **AUTO LOCK cover** ⓯
Keep this cover closed when adjusting the focus, white balance, or shutter speed automatically. To adjust these manually, slide open this cover so that the buttons inside can be seen.

27 **FOCUS button** ㉑
Used for manual focusing.

28 **SHUTTER SPEED button** ㉕
Used to select the shutter speed.

29 **SUPERIMPOSE buttons** ㉜
Used to record the title.
MEMORY button
COLOR/MODE button

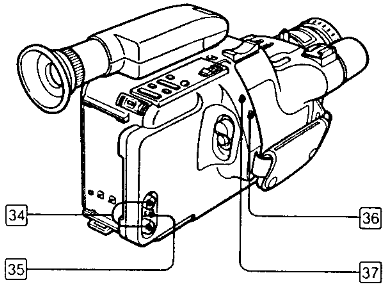
30 **BACK LIGHT button** ㉔

31 **WHITE BAL (white balance) button** ㉓
Used for manual white balance adjustment.

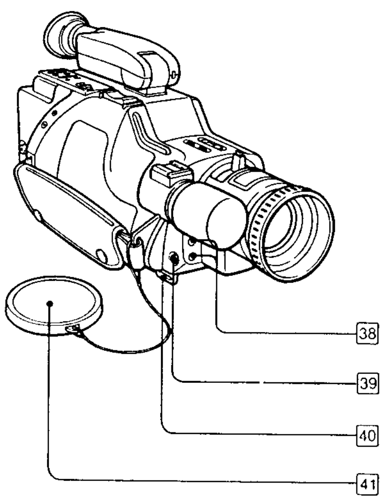
32 **SUPERIMPOSE ON/OFF button** ㉜

33 **DATE (+) and TIME (NEXT) buttons** ㉙
Press to display or turn off the date or time.

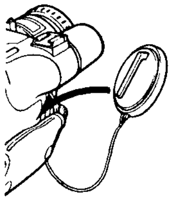
A-4



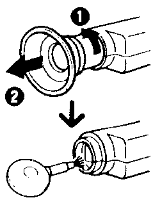
A-5



A-6



A-7



Location and Function of Parts and Controls

A-4

34 **VIDEO/AUDIO OUT (output) jacks (phono jacks)**

35 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)**
Supplies power to the RFU adaptor.

36 **℗ (earphone) jack (minijack)**

37 **REMOTE connector (stereo mini-minijack)**
Connect an optional GP-80 Remote Commander or wired Remote Commander RM-95.
Do not connect other equipment.

A-5

38 **MIC jack and DC OUT (microphone power output) jack**
Connect an external microphone.
The MIC jack accepts Sony "plug-in-power" microphones and supplies power to them.

39 **REC START/STOP button for low position** ⓱

40 **Hook for shoulder strap**
Attach a shoulder strap.

A-6

41 **Lens cap**
Sqeeze both sides of the lens cap to remove it. Hook it to the grip strap so it won't be lost or hanging loose while recording.

To remove dust from inside the viewfinder A-7
Detach the eyecup as illustrated and clean the surface of the cathode ray tube with a blower.

Power Sources

Selection of Power Sources

This manual shows the operations on one of the following power sources.

Place		Power source	Accessory to be used
Place	Indoors	House current	AC power adaptor AC-V30 or AC-V55 (page 11)
	Outdoors	Battery pack	Battery pack NP-66H, NP-77H, NP-77 or NP-55 (page 9) Battery case EBP-55 or EBP-77 (page 10)
	In the car	12 V or 24 V car battery	DC pack DCP-55 (page 11) (DCC-16B car battery cord supplied)

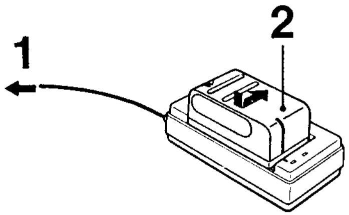
Notes on power source

- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted cassette tape. If this is done by accident, supply the power again immediately and turn on the power switch.
- Be careful not to let any metal object touched on the metal part on the battery pack or AC power adaptor. When the battery pack is not to be used, keep it in its case.

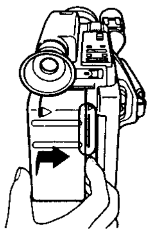
Optional Accessories for Charging

- **AC-V55 AC power adaptor**
  Two battery packs can be charged simultaneously.
- **DC-V30 car battery charger**
  Connect to the cigarette lighter socket of a car to charge an NP-66H/77H/77/55 battery pack, or to supply power to Sony 8 mm video equipment that operates only on NP-66H/77H/77/55.
- **BC-55/77 battery charger**
  Portable battery charger for charging an NP-66H/77H/77/55 battery on 100 – 240 V AC.

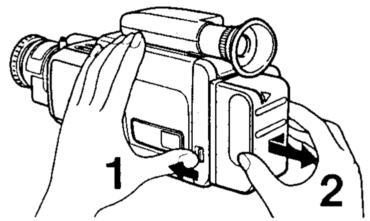
B-1



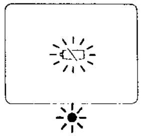
B-2



B-3



B-4



Battery Pack — NP-66H/77H/77/55

First, charge the battery pack. B-1
Use the AC-V30 AC power adaptor.
The charging time is as follows:

NP-66H	Approx. 1 hr. 40 min.
NP-77H	Approx. 2 hr. 20 min.
NP-77	Approx. 2 hr.
NP-55	Approx. 1 hr.

1 Connect the AC-V30 to a wall outlet.
2 Attach the battery pack to the AC-V30. Align the grooves on the battery pack with those on the AC-V30, and while pressing the battery pack, slide it as illustrated.

To attach the battery pack to the video camera recorder B-2
Align the right side of the battery pack with the line on the recorder, and while pressing the battery pack, slide it to the right.
Make sure that the battery is fitted completely to the mounting surface. Imperfect fit may damage the projections on the recorder.

To remove the battery pack B-3
While pressing the BATT knob in the arrow direction, slide and pull out the battery pack as illustrated.

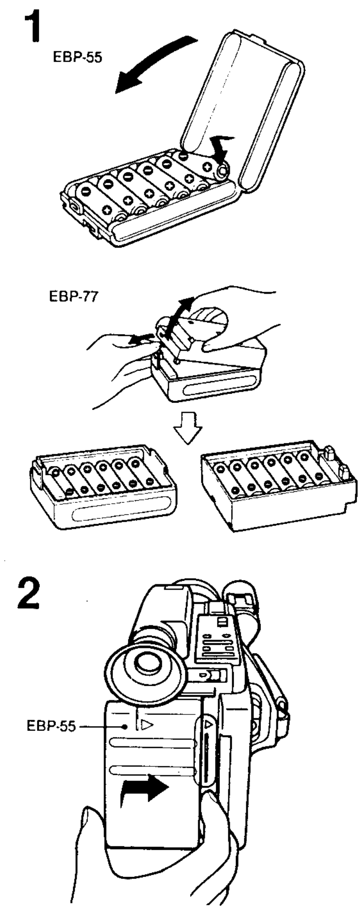
Battery life
A fully-charged battery pack provides continuous camera recording for the following period of time.

NP-66H	Approx. 1 hr. 15 min.
NP-77H	Approx. 1 hr. 55 min.
NP-77	Approx. 1 hr. 20 min.
NP-55	Approx. 40 min.

When the video camera recorder is not in use, remove the battery pack.
If the battery is installed, even if the POWER switch is set to OFF, a very small amount of electric current flows.

When the battery becomes weak B-4
The ▭ indication and red lamp blink in the viewfinder.
Replace the battery pack with the fully charged one.

B-5



Notes

- The video camera recorder consumes power even in the recording pause mode. When recording short scenes using the recording pause mode, the battery life is less than half that of continuous recording.
  When recording is not to be started soon, turn off the power with the STANDBY switch.
- If the battery pack is not fully charged or if it is used in a cold place, its operating time is also shortened.

Battery Case B-5

1 Insert R6 (size AA) alkaline batteries into the battery case.
EBP-55: 6 batteries
EBP-77: 12 batteries
2 Align the right side of the battery case with the line on the recorder, and while pressing the battery case, slide it to the right.

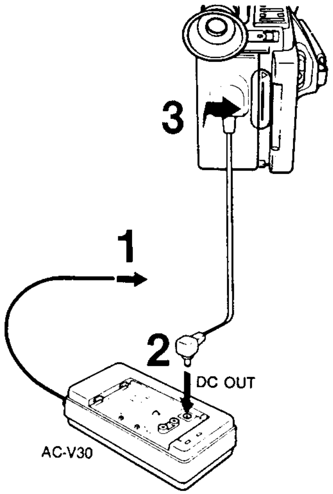
To remove the battery case
While pressing the BATT knob on the recorder, slide and pull out the battery case.

Battery life
EBP-55: Approximately 40 min.
EBP-77: Approximately 120 min.
(with new batteries, continuous recording indoors)

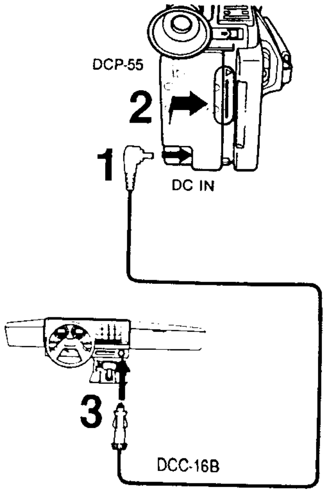
Notes on the battery case

- Be sure to use the alkaline batteries.
- The battery case cannot be used in a cold place.
- The ▭ indication may not blink when the batteries in the battery case become weak, as the voltage of the battery lowers suddenly. If the cassette compartment does not open, replace the batteries.

B-6



B-7



House Current — Using AC Power Adaptor B-6

1 Connect the AC power adaptor to a wall outlet.
2 Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.
3 Align the right side of the connecting plate with the line on the recorder, and while pressing the connecting plate, slide it to the right.

To remove the connecting plate for the AC power adaptor from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the connecting plate.

The optional AC-V55 AC power adaptor can also be used to operate this recorder on house current.

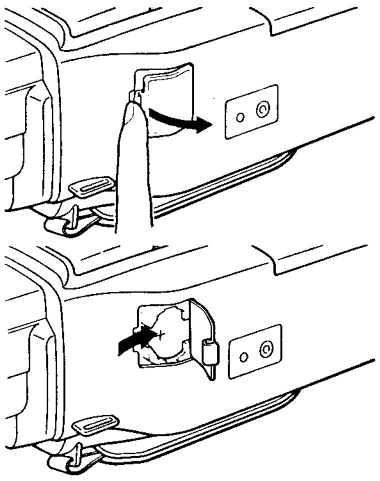
Car Battery — Using the DC Pack B-7

1 Insert the DCC-16B car battery cord supplied with the DCP-55 DC pack into the DC IN jack on the DC pack.
2 Align the right side of the DC pack with the line on the recorder, and while pressing the DC pack, slide it to the right.
3 Connect the DCC-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).

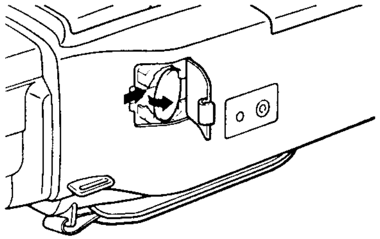
To remove the DC pack from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the DC pack.

The optional AC-V55 AC power adaptor and the DCC-16AE car battery cord can also be used to operate this recorder on a 12V or 24V car battery.

C-1



C-2



Power Sources

Lithium Battery C-1

To insert the lithium battery
This unit uses a lithium battery to activate the clock and keep a title in memory. Before operating the unit for the first time, install the supplied lithium battery:

1. Open the cover of the lithium battery compartment on the bottom.
2. Install the supplied CR2025 lithium battery with the ⊕ side facing out.
3. Close the cover.

To remove the lithium battery C-2
Press the side of the battery in the direction as indicated for installation.

Lithium battery life
Approximately 1 year in normal operation. When the lithium battery becomes weak, the time indication will blink on the viewfinder screen for about 5 seconds whenever the POWER switch is set to CAMERA.
In this case, replace the battery with a Sony CR2025 lithium battery. Use of another battery may present a risk of fire or explosion.
After replacing the battery, readjust the date, time and title. (If the battery is replaced with the battery pack attached, the readjustments are not necessary.)

Notes on lithium battery

- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.

Selection of the Automatic or Manual Adjustments

When the AUTO LOCK cover is closed, the white balance, shutter speed (1/50), focus and iris are adjusted automatically. But under certain circumstances, manual adjustment is better for effective recording.

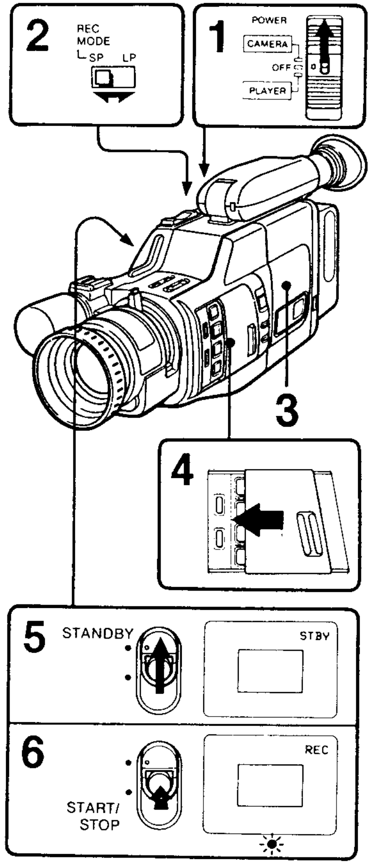
When the AUTO LOCK cover is slid open, each manual function works as follows.

Each push of the button cyclically changes each function and the indication on the viewfinder changes.	
WHITE BAL See page 23.	No indication → HOLD → ☀ → ✲ (Auto)
SHUTTER SPEED See page 25.	No indication → 120 → 250 → 1000 → 2000 → 4000 (1/50) (1/120)(1/250)(1/1000)(1/2000)(1/4000)
FOCUS See page 21.	Auto focusing zone → ■ (Auto) (Manual)
BACK LIGHT See page 24.	No indication → ▨ (Back light)

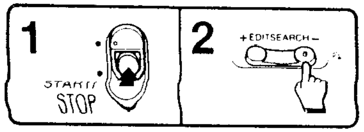
Notes

- Just after the battery pack is attached to the recorder, the AUTO LOCK function will work even if the AUTO LOCK cover is opened.
- If the AUTO LOCK cover is closed after each function is adjusted manually, and then opened again, the previous manual setting will be recalled.

F-1



F-2



Easy Camera Recording with Automatic Adjustment

How to Record

F-1

1 While pressing the small button, set the POWER switch to CAMERA.
2 Insert the cassette.
3 Set the REC MODE selector to LP or SP, according to the length of the programme to be recorded.
4 Keep the AUTO LOCK cover closed.
5 Slide the STANDBY switch up.
The unit will enter the recording pause mode.
6 Press the START/STOP button.
Recording will start.

Check on the viewfinder screen
STBY: Displayed during recording pause mode.
REC: Displayed during recording.

To stop recording
Press the START/STOP button again.
The unit will enter the recording pause mode. Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

F-2

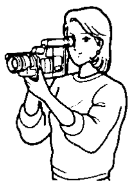
To check the last portion of the previous recording (Recording review)
1 Set the recorder in recording pause mode by pressing the START/STOP button.
2 Press the – ⊜ EDITSEARCH button momentarily.

The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

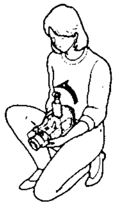
If the picture has not been recorded
The video head may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette.

After using
Slide the STANDBY switch down and set the POWER switch to OFF. (You need not press the centre button when setting the switch to OFF.)

F-3



F-4



Easy Camera Recording with Automatic Adjustment

Hold the camera recorder as in the illustration.
If your nose touches the recorder, adjust the angle of the viewfinder. F-3

F-4

For low position recording
The viewfinder can be turned 90 degrees up.
1 Slide the STANDBY switch up.
2 Press the START/STOP button on the right front.

Note on power source
If the POWER switch is moved during recording, the tape will stop.

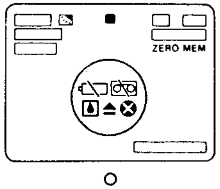
Notes on light sources
- Should you shoot a subject in bright conditions such as sunlight just after shooting in a dark place, the picture may not appear on the viewfinder screen. In this case, move the camera away from the subject to resume the normal condition.
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.

Notes on playback on another VTR
- To view the picture which has been recorded on this unit, set the monitor switch of the recorder for playback to the STD (standard) position.
- When recording on this unit using a tape on which PCM stereo sound has previously been recorded, set the monitor switch of the video cassette recorder for playback to the STD (standard) position. Otherwise, the sound may not be heard or may be distorted.

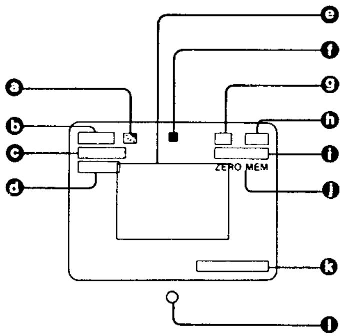
Notes on automatic adjustment
- During recording with auto focusing, do not turn or stop the focus ring (lens hood) forcibly.
- Keep the lens clean.

The camera recording with automatic adjustment may not produce optimum results under certain conditions. In this case, manually adjust the focus, white balance, back light and shutter speed. See pages 20, 22, 24 and 25.

F-5



F-6



Indications inside the Viewfinder

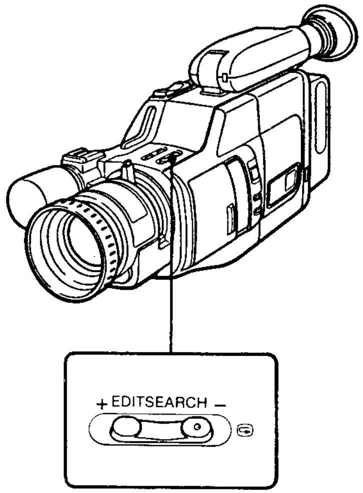
Indications for caution F-5

▭	Slow blinking • The battery is weak. Fast blinking • The battery is exhausted.
⊠	Slow blinking • No cassette is inserted. • The tab on the cassette is out (red). Fast blinking • The tape is at its end.
⏏	Blinking • A fault has occurred in the unit. See back cover.
⊗	Blinking • The gap of the video head is clogged. (Head contamination) See back cover.
▣	Blinking • Moisture has condensed inside the unit.

Indications for showing the function in use F-6

ⓐ	The back light function has been activated.
ⓑ	Indicates the white balance mode.
ⓒ	Indicates the title mode.
ⓓ	Indicates the shutter speed.
ⓔ	Indicates the auto focusing zone.
ⓕ	• Lights when the focus function has been set to manual. • Blinks when the auto focus function may not work correctly due to low light or low contrast. See page 20.
ⓖ	Indicates the recording/playback mode (SP/LP).
ⓗ	In the VTR operation mode, this indicates the tape transport function.
ⓘ	Indicates the tape counter.
ⓙ ZERO MEM	Blinks when the ZERO MEM button has been pressed.
ⓚ	Indicates the date or time.
ⓛ	• Lights in red during recording. • Blinks when the battery is weak.

F-7



Instant Playback on the Spot F-7

You can monitor the picture just recorded on the viewfinder screen.

1. While pressing the small button, set the POWER switch to CAMERA.
2. Slide the STANDBY switch up.
3. Keep pressing the "–" side of the EDIT-SEARCH button to view the playback picture in reverse.
4. Keep pressing the "+" side of the EDIT-SEARCH button to view the playback picture.

During Recording, to Record Again on the Previous Recorded Portion (Editsearch 1)

1. Slide the STANDBY switch up.
2. Monitor the picture on the viewfinder screen and locate the point from which the recording is to begin again with the EDITSEARCH button.
   Press the "+" side of the EDITSEARCH button to advance the picture at a normal playback speed, or the "–" side to reverse the picture.
3. At the desired point, release the EDITSEARCH button.
   The unit will be set to recording pause mode.
4. Press the START/STOP button to start recording.

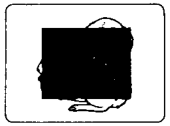
Smooth recording can be made even if the recording is stopped and started again, or even if the power is turned off and on again, provided that the cassette is not removed. But, if the cassette has been removed, proceed as above.

To monitor the sound while viewing the playback picture on the viewfinder screen
Connect an earphone to the ⓟ jack.

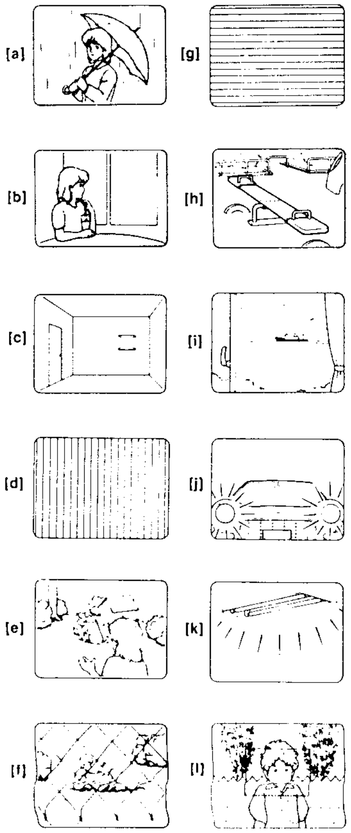
1. While pressing the small button, set the POWER switch to PLAYER.
2. Press the ◀◀ button to rewind the tape.
3. Press the □ button to stop the tape.
4. Press the ▷ button to start playback.

To stop the playback, press the □ button.

G-1



G-2



Manual Focusing

When the AUTO LOCK cover is closed, correct focusing is obtained in most cases if the subject is displayed in the auto focusing zone (illustrated in blue). G-1
Use manual focusing when shooting subjects difficult to focus automatically.

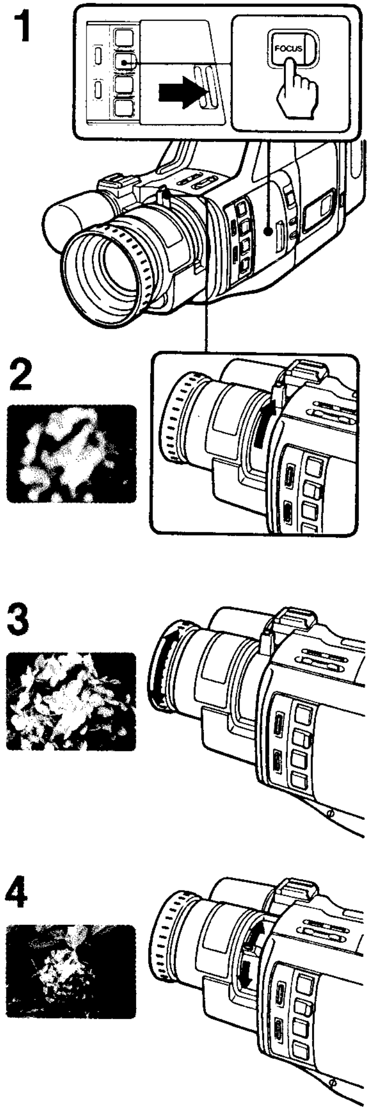
Poor Conditions for Auto Focusing G-2

[a] Insufficient light
[b] Too much bright light behind the subject
[c] Subjects with flat colours and less contrast — wall, sky, etc.
[d] Finely detailed repetitive patterns
[e] When the distance between subjects at the centre is extreme (e.g. one subject is close, the other is away)
[f] Subjects beyond screens, nets, etc. or when another subject passes across the camera
[g] Horizontal stripes
[h] Diagonal object
[i] When there is frosted glass between the shooting object and the recorder
[j] Bright object or object reflecting light
[k] When shooting under a fluorescent lamp at the shutter speed set to 1/250, 1/1000, 1/2000 or 1/4000
[l] When there is a high contrast background within the auto focusing zone (The background may be focused.)

Other Uses of Manual Focusing

- When the white mark inside the viewfinder blinks
- When using special effects lenses or filters
- When shooting still subjects on a tripod
- To save battery wear
  (As long as the AUTO LOCK cover is closed, the auto focusing operates and the focus ring moves automatically even in recording pause mode. This causes the battery to wear continuously.)
- For focusing in close-up shooting.

G-3



Notes
Since the auto focusing system of this unit detects the contrast of the video signal for accurate focusing, it does not function momentarily in these cases:

- When the shutter speed or the white balance is changed
- When the back light is being adjusted
- When lighting conditions change quickly
- When the zooming is changed from wide-angle to telephoto

It may take several seconds to get focus when the camera is rapidly panned from a distant subject to a near subject with less contrast. In this case, adjust the focus manually.

Note on automatic adjustment
During recording with auto focusing, do not turn or stop the focus ring forcibly.

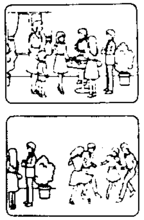
To Focus Manually G-3

1 Slide open AUTO LOCK cover and press the FOCUS button.
The white mark (■) will be shown in the viewfinder.
2 Turn the manual zoom lever to the telephoto position (68) to make the subject as large as possible in the viewfinder.
3 Turn the lens hood (focus ring) to achieve sharp focus.
4 Set the desired shot length using the manual zoom lever.

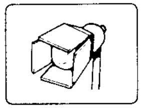
Some helpful hints

- When shooting a scene with lots of movement in bright light, the subject can be kept in good focus by setting the zoom lever to the wide-angle position and the focus ring to 2 m, regardless of the distance between the subject and the recorder.
- When shooting in low light situations such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles, after focusing in telephoto.
- The figures on the focus ring indicate the distance between the subject and the Φ mark beneath the AUTO LOCK cover.
- Recommended illumination of this unit is more than 300 lux (28 footcandles). If shooting is done indoors or under other circumstances where light is insufficient, video lights must be used for best results. Under adequate light condition, the depth of field in proper focus is wider and a sharper picture will be recorded.

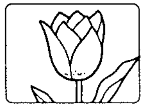
H



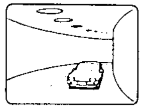
[a]



[b]

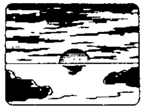


[c]



[d]

[e]



[f]

Manual White Balance Adjustment

When the AUTO LOCK cover is closed, the auto white balance function of this unit operates automatically in most cases. However, if it does not work correctly in the conditions listed below, adjust the white balance manually.

Difficult Conditions for Auto White Balance H

Recording condition		Indication in the viewfinder
[a]	When lighting conditions change quickly	☼
[b]	When the light source for the subject is different from that illuminating this unit, such as when the subject is in a spotlight, etc.	☼
[c]	When shooting a monochromatic subject or the background is monochromatic	HOLD
[d]	When recording under a sodium lamp	☼
	When recording under a mercury lamp	☼
	When recording under a colour matching fluorescent lamp	☀
[e]	When recording outdoors, such as a night view, neon sign or fireworks	☀
[f]	When recording outdoors, such as scenes after sunset or scenes before sunrise.	☀

To Adjust the White Balance Manually

1 While pressing the small button, set the POWER switch to CAMERA.
2 Slide open the AUTO LOCK cover.
3 Select the desired white balance mode by pressing the WHITE BAL button.
Each push of the WHITE BAL button cyclically changes the indication inside the viewfinder.

No indication (Auto) → HOLD → ☀ → ☼

For the colour temperature and the white balance adjustment, see page 49.

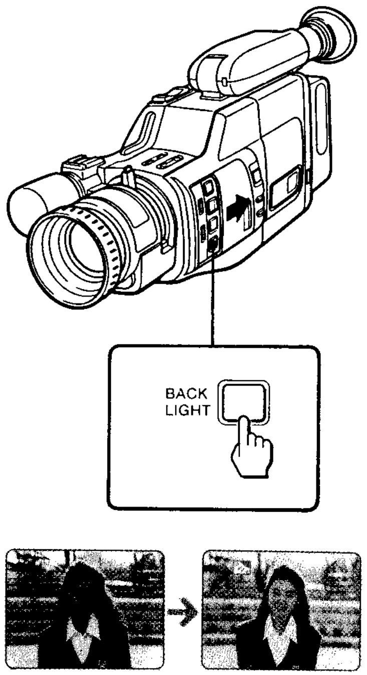
To adjust the white balance precisely

1 Set the WHITE BAL button to auto mode (no indication).
2 Point the recorder to a white, flat object such as a white wall, paper, etc.
3 Press the WHITE BAL button to indicate the HOLD mark inside the viewfinder.
The correct white balance is memorized.

Notes

- When the power is turned off or the light source is changed, reset the HOLD mode again.
- The white balance is related to back light and shutter speed adjustment. When the shutter speed has been adjusted manually with the AUTO LOCK cover opened, and then if the recorder is moved from indoors to outdoors, or vice versa, close the AUTO LOCK cover and open it again.
- When using the recorder in the automatic adjustment mode with the AUTO LOCK cover closed, and then moving from indoors to outdoors, or vice versa, slide the STANDBY switch up and point the recorder to a white object for about 10 seconds so that the white balance is adjusted properly.

I



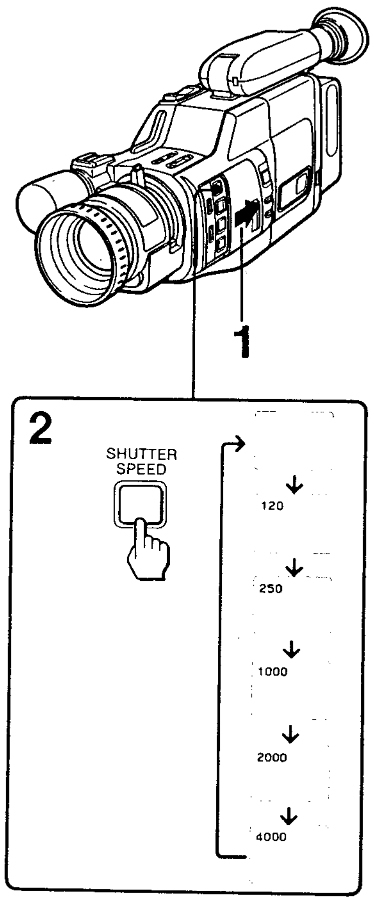
Back Light Adjustment I

This unit adjusts the iris automatically. However, when shooting a subject that is backlit, slide open the AUTO LOCK cover, and press the BACK LIGHT button.
The ▨ indication appears on the viewfinder screen.

After shooting that particular scene, be sure to press the BACK LIGHT button again to release it. Otherwise the recorded picture will be too bright.

Note
The function will be released once the POWER switch is set to OFF.

J



Shutter Speed Adjustment

When a fast-moving subject is recorded at a normal shutter speed, the picture may not be seen clearly when played back. This can be improved by increasing the shutter speed.
The shutter speed of this unit can be selected from six speeds, 1/50 (normal speed), 1/120, 1/250, 1/1000, 1/2000 or 1/4000 second.
However, when the shutter moves fast, it will not allow enough light to come into the lens, so the picture will be dark. Therefore, when recording at a high shutter speed, record in a brighter place than usual.
Choose an appropriate shutter speed according to the place and situation.
See the chart below for examples.

Example use	Recommended shutter speed
• On clear days, recording golf or tennis scenes (To view the hit ball clearly in the pause mode, set to 1/4000) • Recording the skiers	1/4000 or 1/2000
• On overcast days, recording a moving merry-go-round or jet-coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
• Instead of the ND2 filter (To reduce the exposure level to approx. 1/2) • Recording indoors (for stable shooting)	1/120

J

1 Slide open the AUTO LOCK cover.
2 Press the SHUTTER SPEED button repeatedly until the desired shutter speed indication appears on the viewfinder screen. Each time the SHUTTER SPEED button is pressed, the indication changes:

No
indication → 120 → 250 → 1000 → 2000 → 4000
(1/50) (1/120)(1/250)(1/1000)((1/2000)(1/4000)

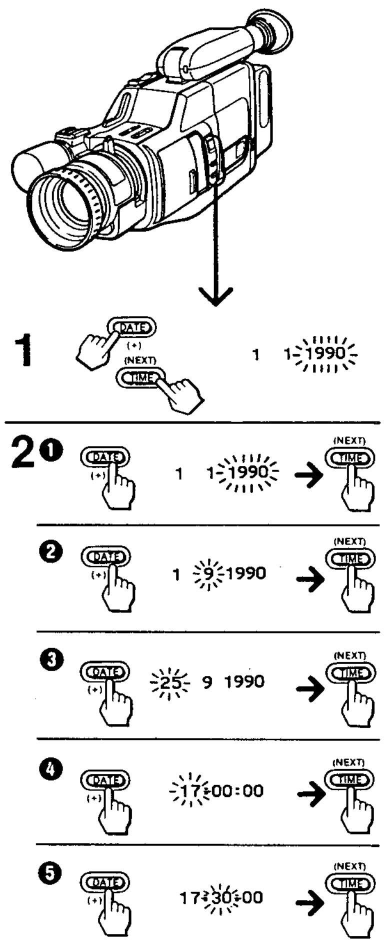
Auto focus will not function when a shutter speed other than the normal speed and 1/120 is selected under a fluorescent lamp.
When shooting, use manual focusing.

Shutter Speed Adjustment

Notes

- A ghost image will appear in still picture mode of this unit. To view a clear still or slow picture, use another video cassette deck with the clean still/slow function.
- When shutter speed 1/250 or faster is selected, recording must be done under sunlight or video light.
- When the shutter speed is changed during a camera recording of a TV screen, the brightness of the recorded picture may vary.
- When a very bright object is shot at a faster shutter speed, a light, vertical, belt-like line ("smear") may appear on the screen.
- When the recording is done under a light discharged tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary ("flicker").

M-1



Recording Date or Time

Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

- Make sure that the fully-charged battery pack and lithium battery are installed.
- Set the POWER switch to CAMERA, and slide the STANDBY switch up.

To Set Date and Time M-1

1 Press the DATE and TIME buttons **simultaneously for more than 3 seconds.** The date indication will appear in the viewfinder (date/time setting mode). The DATE button now functions as the + button and the TIME button functions as the NEXT button.

2 Adjust the ❶ year, ❷ month, ❸ day, ❹ hour and ❺ minute in sequence, following the illustration. First adjust the blinking digits with the + button, and then press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

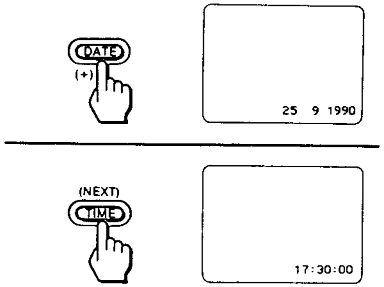
The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

To clear the time indication from the display
Press the TIME (NEXT) button again.

The + button can be pressed in two ways

- When you keep the button pressed, the digits will advance continuously.
- When you press and immediately release the button, the digits will advance by one.

M-2



Recording Date or Time

To check the preset date and time
Press the DATE or TIME button in the recording pause mode. When the same button is pressed again, the indication goes off.

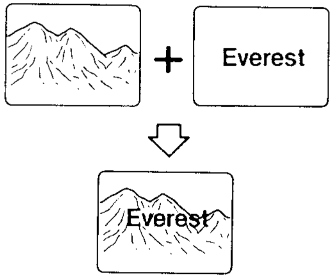
To readjust an incorrect date or time
Set the unit to date/time setting mode and press the NEXT button repeatedly until the incorrect digit blinks. Correct it with the + button and press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

To Record the Date or Time M-2

During camera recording or in recording pause mode, press the DATE or TIME button to display the date or time on the viewfinder screen.
The date or time being displayed will be recorded together with the picture.

To stop recording the date or time
Press the DATE or TIME button again. The picture recording will continue.

N-1



Recording a Title

Before recording, memorize a title or figure. The memorized title or figure is superimposed onto the picture being recorded. N-1

The colour of the title or figure can be selected from 8 colours.

Make sure that the lithium battery is installed. See page 12.

To make a desired title card

- Use a white and plane card and draw the title on it with a deep colour (black is recommended for the best result) in thick letters.
  If contrast is clear, a signboard can be memorized like the title card.
- When deciding the title size, check the effective picture size on your video monitor.

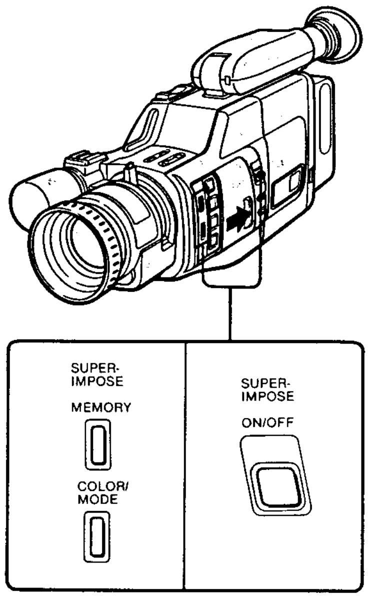
Before memorizing a title

- Fix the title card and the video camera recorder.
- Use of an appropriate light is recommended for a better result.

Function of the COLOR/MODE button
This button is used to select the title colour or title mode.

When the title is displayed	**When the title is not displayed**
Used as the COLOR button.	Used as the MODE button.
→WHT→BLUE→GRN→CYAN→RED→VIO→YEL→BLK→ (WHT) (white) (green) (violet) (yellow) (black)	No title mode → ↑ → 🆃 → 🆃↑ → No title mode ↑ : title scroll mode 🆃 : title reverse mode 🆃↑ : title reverse and scroll mode
Each push of the COLOR/MODE button cyclically changes the colour or mode.	

N-2



To Memorize the Title N-2

1 While pressing the small button, set the POWER switch to CAMERA.
2 Slide up the STANDBY switch to set the unit in the recording pause mode.
3 Point the camera to the title card and adjust the focus.
4 Press the MEMORY button to memorize the title.
5 Select the title colour while observing the colour indication in the viewfinder. Each push on the COLOR/MODE button cyclically changes the colour, as follows:

WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

6 Press the ON/OFF button to turn off the title.

Notes

- The colour indication in the viewfinder is not recorded on the tapes.
- You can change the title colour even after starting the recording.
- If you open the AUTO LOCK cover half to expose the SUPERIMPOSE buttons only, you can memorize the title with the automatic adjustment.

To check the title
To check the memorized title, press the ON/OFF button. To turn off the title, press the button again.

To Record the Title

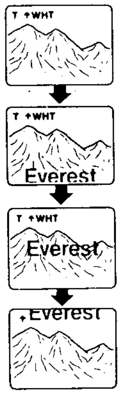
To record the title from the beginning
Press the ON/OFF button in recording pause mode, and then start recording.

To record during camera recording
Press the ON/OFF button at the point from which the title is to be inserted.
The memorized title will be recorded together with the picture.

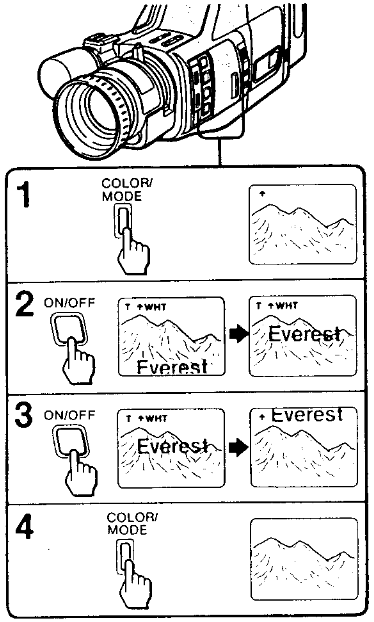
To stop recording the title
Press the ON/OFF button again. The picture recording will continue.

To record the same title several times
By repeating the above procedure, you can record the title as many times as desired.

N-3



N-4



To Scroll the Title from Bottom to Top

During recording, the memorized title can be scrolled from bottom to top. N-3

To check the scrolled title N-4
1 In the recording pause mode, press the COLOR/MODE button.
The arrow mark will be displayed.
2 Press the ON/OFF button.
The title will be displayed from bottom to centre.
3 Press the ON/OFF button again.
The title will be displayed from centre to top.
4 Press the COLOR/MODE button **three times.**
The arrow mark will disappear.

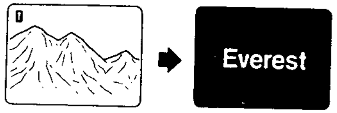
To record the scrolled title
1 In the recording pause mode, press the COLOR/MODE button.
The arrow mark will be displayed.
2 Start the camera recording.
3 Press the ON/OFF button at the point from which the scrolled title is to be recorded.
4 After the title stops at the centre of the picture, press the ON/OFF button again.
The title is scrolled from centre to top.

To clear the scroll mode
After recording, press the COLOR/MODE button **three times.**

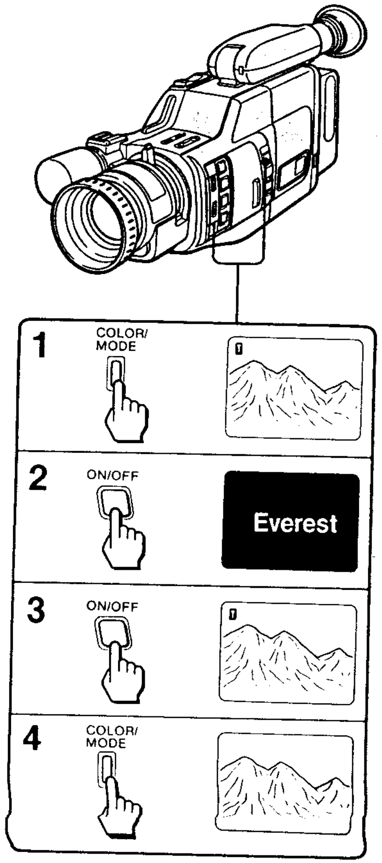
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the title
While the title is being scrolled or displayed at the centre, press the COLOR/MODE button.

N-5



N-6



To Reverse the Title and the Background

The colour scheme of the title and the background can be reversed. N-5

To check the reversed picture N-6

1. In the recording pause mode, press the COLOR/MODE button **twice**.
   The T mark will be displayed.
2. Press the ON/OFF button.
   The reversed title and background will be displayed.
3. Press the ON/OFF button again.
4. Press the COLOR/MODE button **twice**.
   The T mark will disappear.

To record the reversed picture from the beginning

1. In the recording pause mode, press the COLOR/MODE button **twice**.
   The T mark will be displayed.
2. Press the ON/OFF button.
3. Start the camera recording.
4. Press the ON/OFF button again to clear the reversed picture.

To record the reversed picture during recording

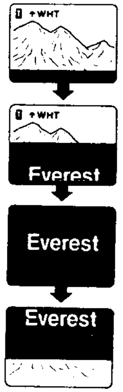
1. In the recording pause mode, press the COLOR/MODE button **twice**.
   The T mark will be displayed.
2. Start the camera recording.
3. Press the ON/OFF button at the point from which the reversed picture is to be recorded.
4. Press the ON/OFF button again to clear the reversed picture.

To clear the reverse mode
After recording, press the COLOR/MODE button **twice**.

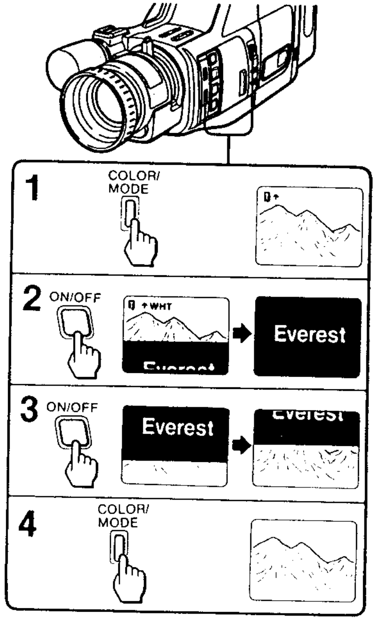
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the background
While the title is being displayed, press the COLOR/MODE button.

N-7



N-8



To Scroll the Reversed Title N-7

To check that the reversed title is scrolled N-8

1. In the recording pause mode, press the COLOR/MODE button **three times**.
   The T↑ mark will be displayed.
2. Press the ON/OFF button.
   The reversed picture will be displayed from bottom to centre.
3. Press the ON/OFF button again.
   The title will be displayed from centre to top.
4. Press the COLOR/MODE button **once**.
   The T↑ mark will disappear.

To record the reversed and scrolled title

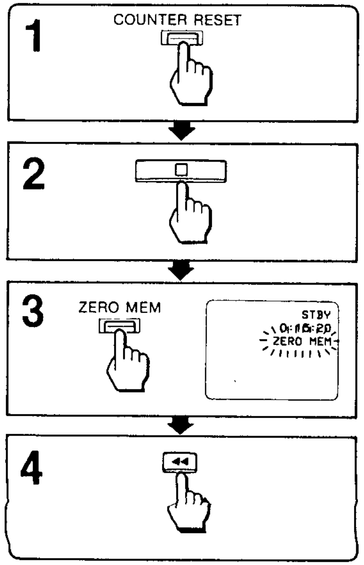
1. In the recording pause mode, press the COLOR/MODE button **three times**.
   The T↑ mark will be displayed.
2. Start the camera recording.
3. Press the ON/OFF button at the point from which the scrolled title is to be recorded.
4. After the reversed title stops at the centre of the picture, press the ON/OFF button again.
   The reversed title is scrolled from centre to top.

To clear the reversed scroll mode
After recording, press the COLOR/MODE button **once**.

If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the background
While the title is being scrolled or displayed at the centre, press the COLOR/MODE button.

S



Use of the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

To Index the Whole Tape

Press the COUNTER RESET button at the beginning of the tape so that the counter shows "0:00:00". By noting the counter reading at a particular point, you can easily find that point later by referring to the tape counter.

Notes

- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide.
- The counter does not operate for a blank, unrecorded portion of a tape.
- There will be a time lag of several seconds on the counter reading after repeated fast-forward and rewind operations.
- There will be also a time lag of several seconds when the tape recorded in LP and SP modes mixed or the tape having a blank portion between the recorded portions is played back.

To Return to a Pre-registered Point S

1. During recording or playback, press the COUNTER RESET button at the point you later want to locate.
2. Press the ☐ button when the recording or playback has finished.
3. Press the ZERO MEM button. The "ZERO MEM" indicator will blink in the display window.
4. Press the ◀◀ or ▶▶ button.
   The tape will be rewound or sent forward and stop automatically when the counter reaches approximately zero.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

Notes

- The ZERO MEM button does not function during recording or playback mode.
  Be sure to press the ZERO MEM button when the tape is stopped.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to zero.

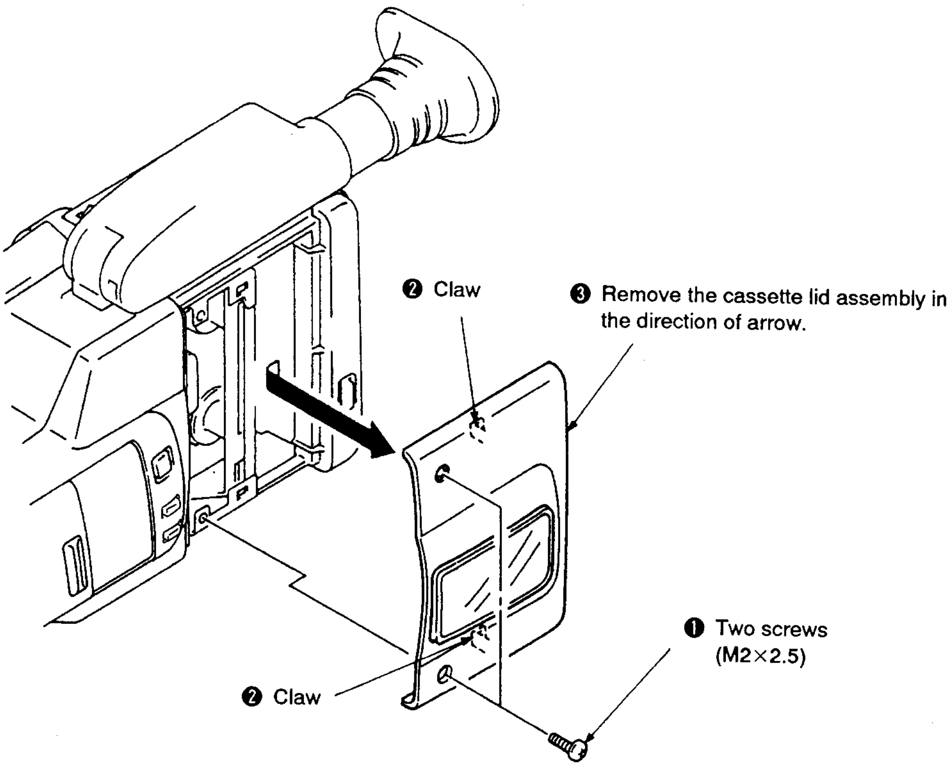
Trouble Indicators

○ when the indicator appears ☐ slow blinking ☐ fast blinking

	Position of the POWER switch		Indicator	
Cause	PLAYER	CAMERA	Indicator to be shown inside the viewfinder	Camera recording/ battery lamp
The battery is fully exhausted.	○	○	🪫	
The battery is weak.	○	○	🪫	
The tape is at its end.		○	📼 ⏏	
No cassette is inserted.		○	📼	
The tab on the cassette is out.		○	📼 ⏏	
Moisture has condensed inside the unit.	○	○	💧 ⏏	
The gap of the head is clogged.	○	○	⊗	
Other troubles	○	○	⏏	
The lithium battery is fully exhausted.		○	0:00:00 (5 seconds) ⇩ 1. 1. 1990 0:00:00	
The lithium battery is weak.		○	Time (5 seconds) ⇩ Normal Indication for the operation	

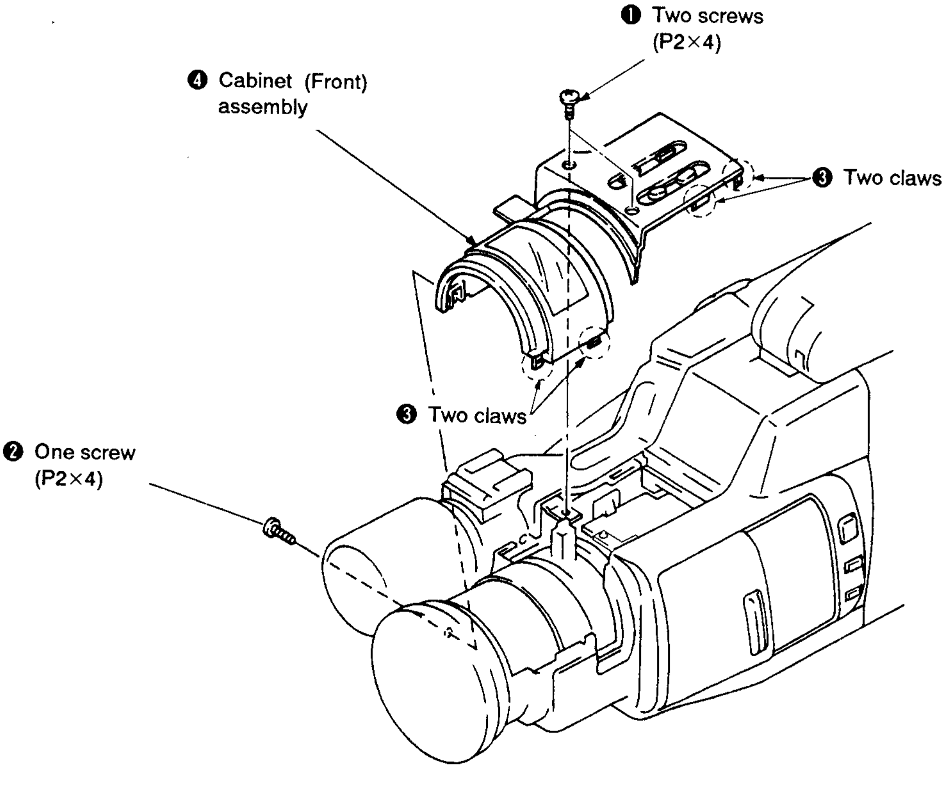
SECTION 2
DISASSEMBLY

2-1. REMOVAL OF CASSETTE LID ASSEMBLY



❷ Claw
❸ Remove the cassette lid assembly in the direction of arrow.
❶ Two screws (M2×2.5)
❷ Claw

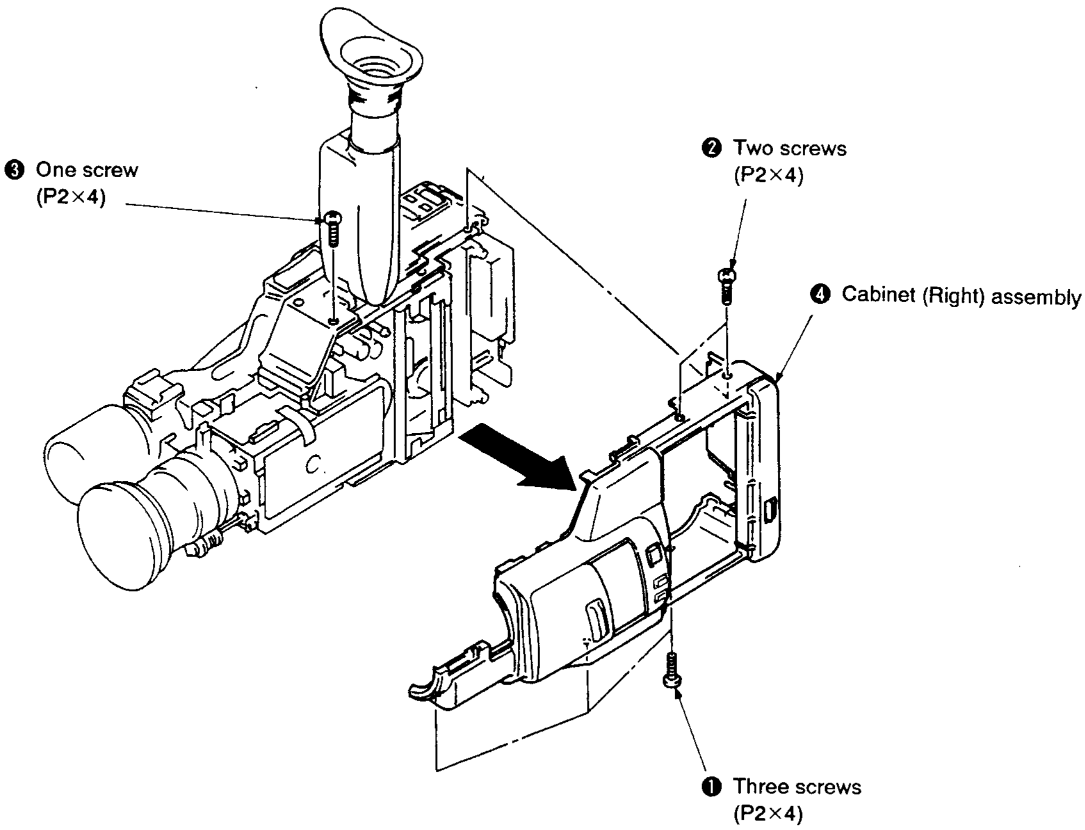
2-2. REMOVAL OF CABINET (FRONT) ASSEMBLY



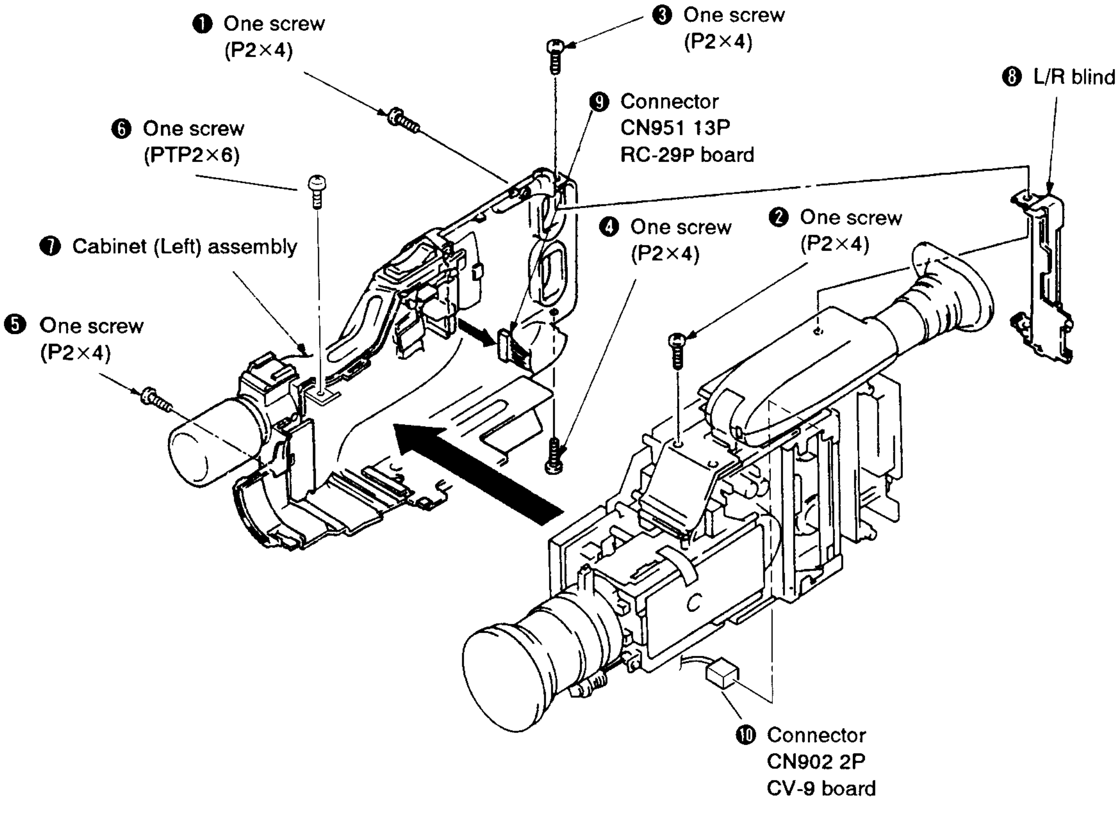
❶ Two screws (P2×4)
❹ Cabinet (Front) assembly
❸ Two claws
❸ Two claws
❷ One screw (P2×4)

2-3. REMOVAL OF CABINET (RIGHT) ASSEMBLY

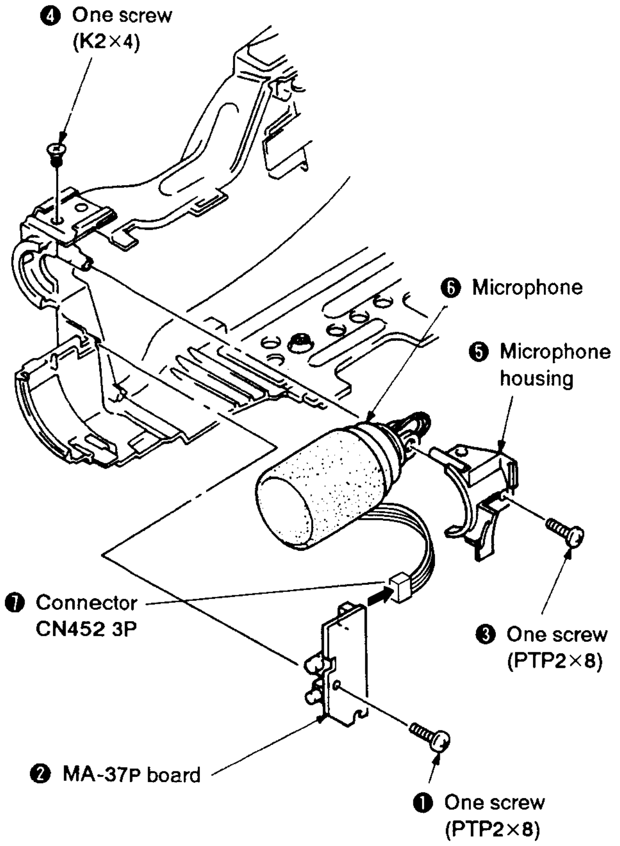
Note: Perform this servicing with EVF raise as the figure below.


❸ One screw (P2×4)
❷ Two screws (P2×4)
❹ Cabinet (Right) assembly
❶ Three screws (P2×4)

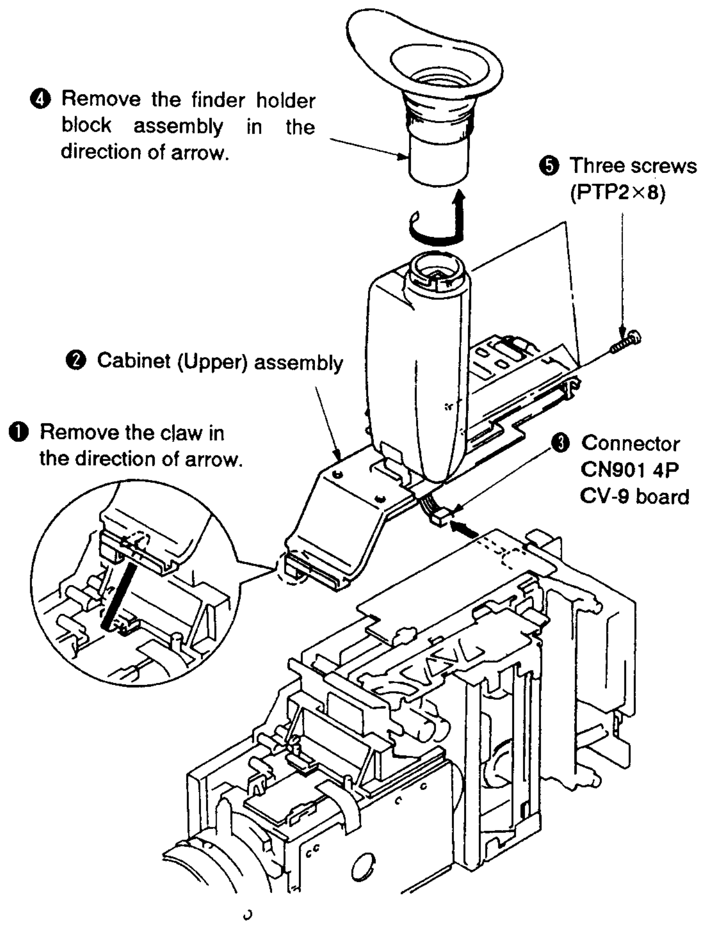
2-4. REMOVAL OF CABINET (LEFT) ASSEMBLY

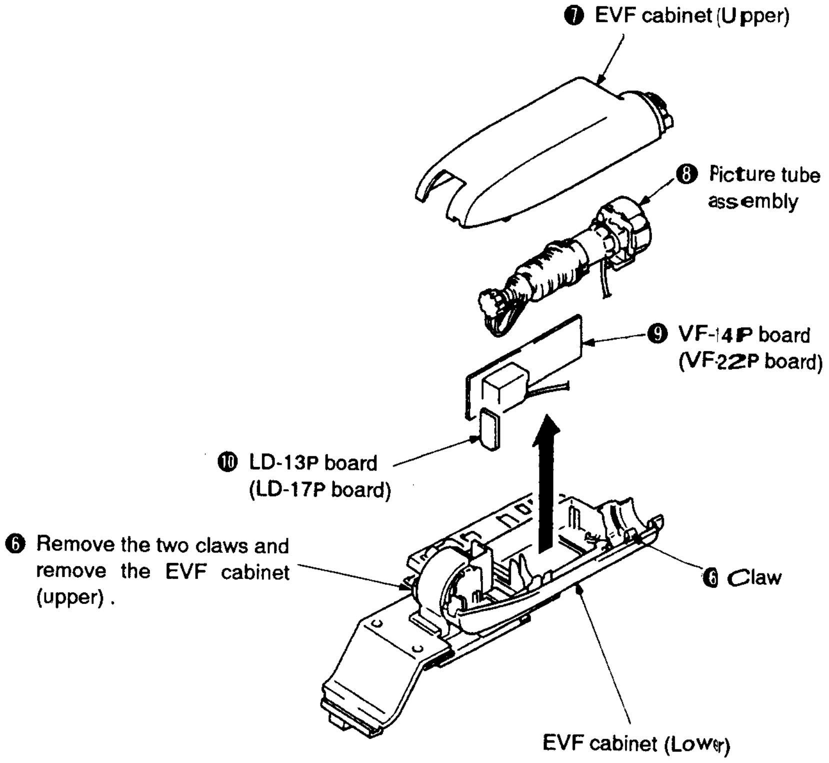

❶ One screw (P2×4)
❸ One screw (P2×4)
❽ L/R blind
❾ Connector CN951 13P RC-29P board
❻ One screw (PTP2×6)
❹ One screw (P2×4)
❷ One screw (P2×4)
❼ Cabinet (Left) assembly
❺ One screw (P2×4)
❿ Connector CN902 2P CV-9 board

2-5. REMOVAL OF MICROPHONE

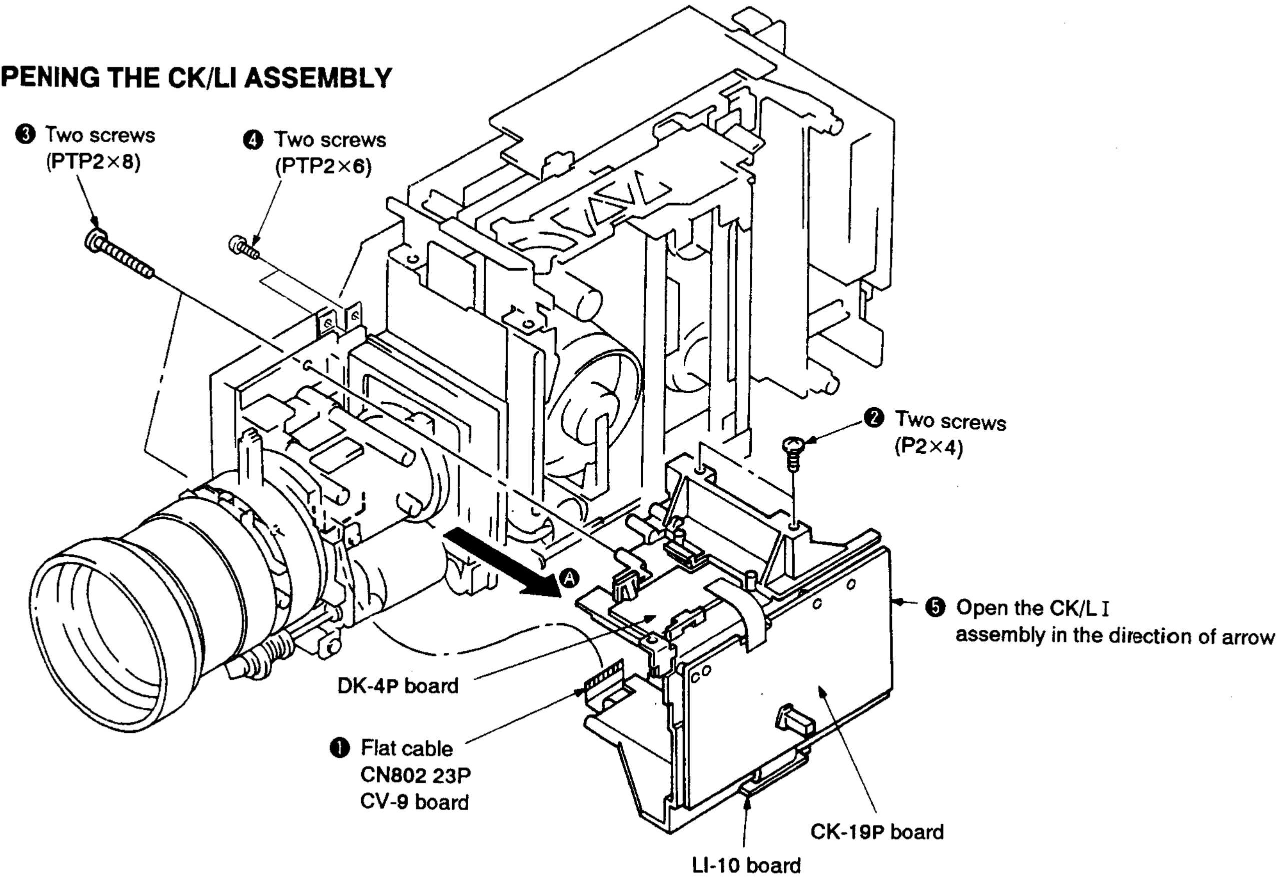

❹ One screw (K2×4)
❻ Microphone
❺ Microphone housing
❼ Connector CN452 3P
❸ One screw (PTP2×8)
❷ MA-37P board
❶ One screw (PTP2×8)

2-6. REMOVAL OF CABINET (UPPER) ASSEMBLY AND EVF

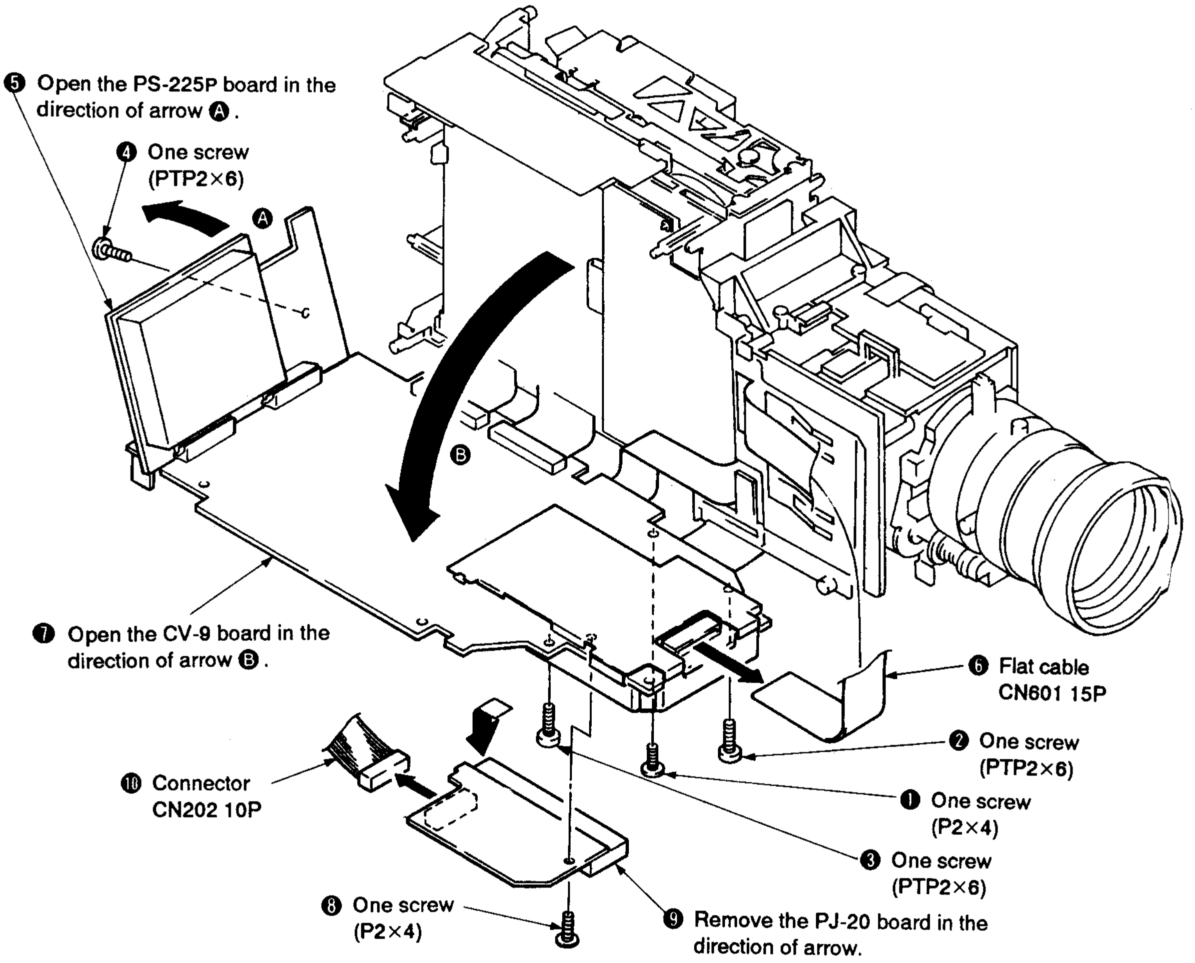

❹ Remove the finder holder block assembly in the direction of arrow.
❺ Three screws (PTP2×8)
❷ Cabinet (Upper) assembly
❶ Remove the claw in the direction of arrow.
❸ Connector CN901 4P CV-9 board


❼ EVF cabinet (Upper)
❽ Picture tube assembly
❾ VF-14P board (VF-22P board)
❿ LD-13P board (LD-17P board)
❻ Remove the two claws and remove the EVF cabinet (upper).
❻ Claw
EVF cabinet (Lower)

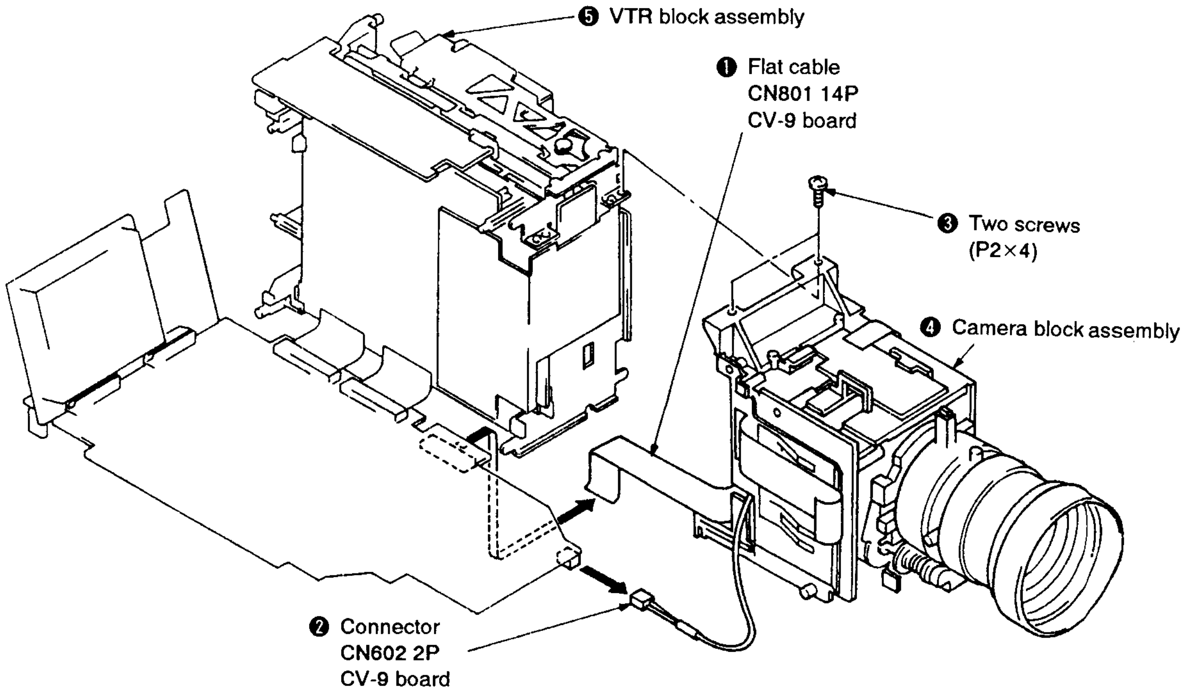
2-7. OPENING THE CK/LI ASSEMBLY


❸ Two screws (PTP2×8)
❹ Two screws (PTP2×6)
❷ Two screws (P2×4)
❺ Open the CK/LI assembly in the direction of arrow
Ⓐ
DK-4P board
❶ Flat cable CN802 23P CV-9 board
CK-19P board
LI-10 board

2-8. OPENING THE PS-225P AND CV-9 BOARDS, AND REMOVAL OF PJ-20 BOARD

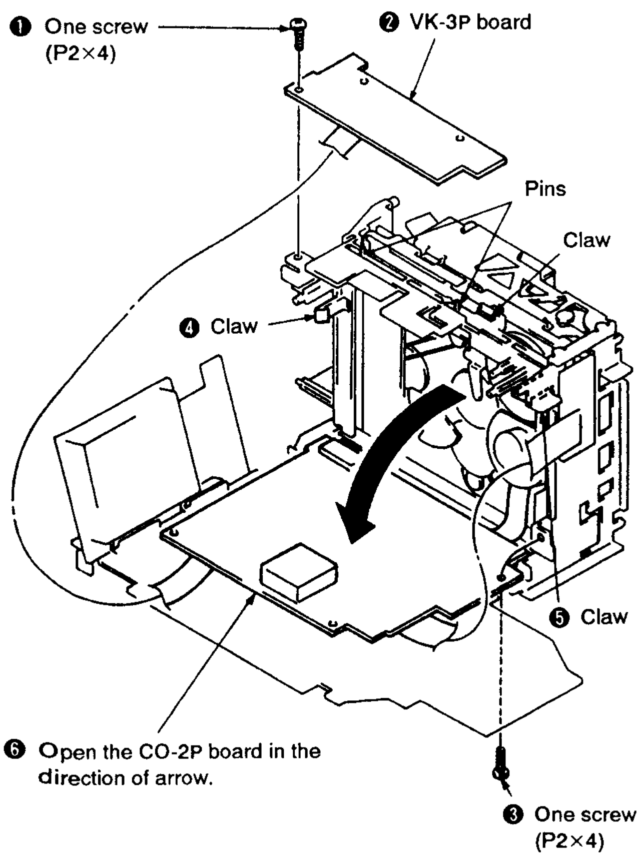

❺ Open the PS-225P board in the direction of arrow Ⓐ.
❹ One screw (PTP2×6)
Ⓐ
Ⓑ
❼ Open the CV-9 board in the direction of arrow Ⓑ.
❻ Flat cable CN601 15P
❷ One screw (PTP2×6)
❶ One screw (P2×4)
❸ One screw (PTP2×6)
❿ Connector CN202 10P
❽ One screw (P2×4)
❾ Remove the PJ-20 board in the direction of arrow.

2-9. SEPARATING THE CAMERA AND VTR BLOCKS

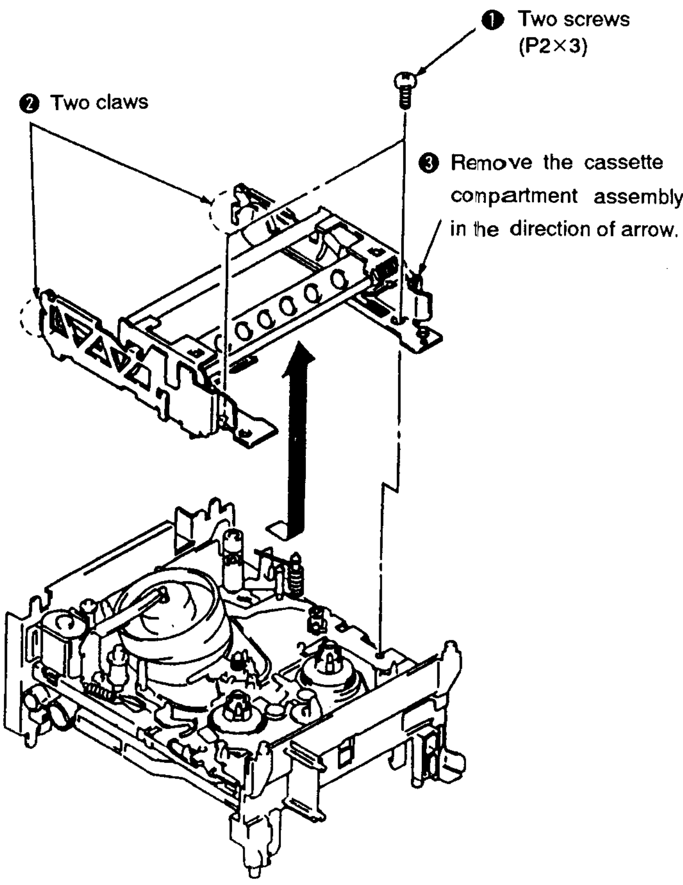

❺ VTR block assembly
❶ Flat cable
CN801 14P
CV-9 board
❸ Two screws
(P2×4)
❹ Camera block assembly
❷ Connector
CN602 2P
CV-9 board

2-10. OPENING THE CO-2P AND VK-3P BOARDS

Notes: 1) Pay attention to two pins and a claw when removing the VK-3 board.
2) Care for the FE shield which is adhered to the RP amplifier shield case with a double coated tape.

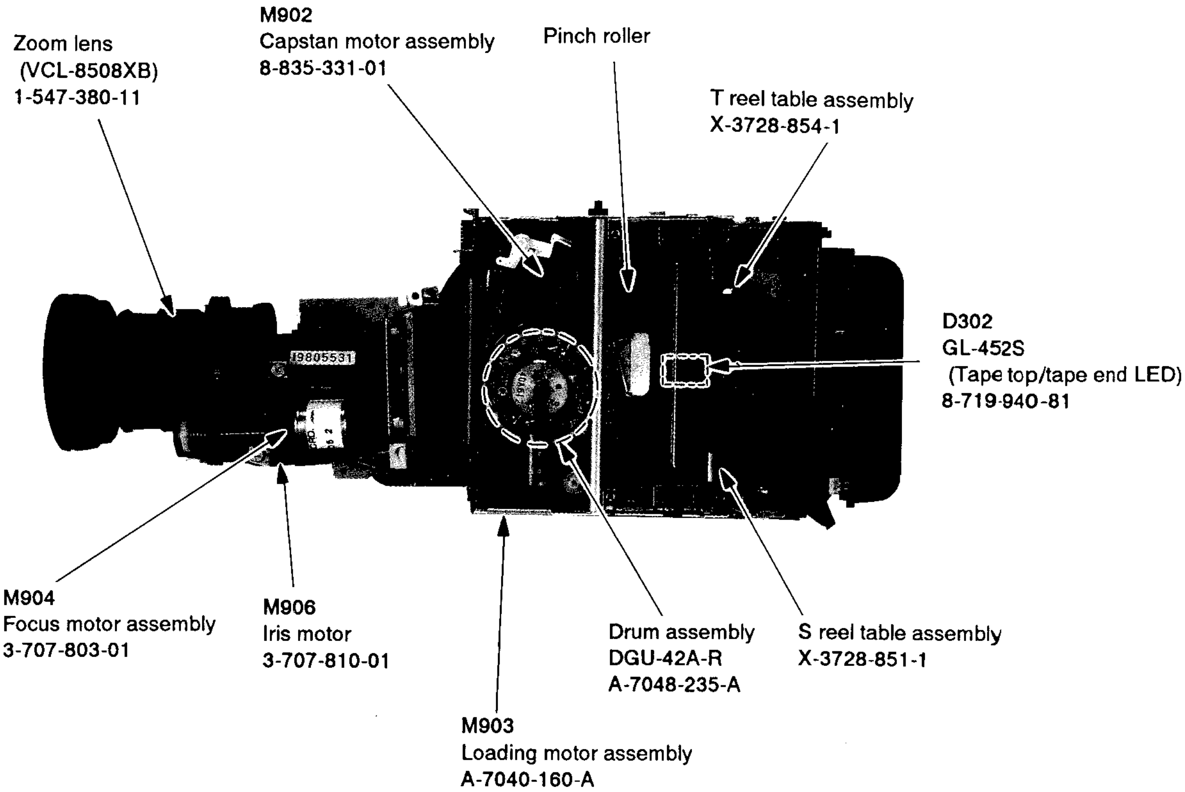

❶ One screw
(P2×4)
❷ VK-3P board
Pins
Claw
❹ Claw
❺ Claw
❻ Open the CO-2P board in the direction of arrow.
❸ One screw
(P2×4)

2-11. REMOVAL OF CASSETTE COMPARTMENT ASSEMBLY

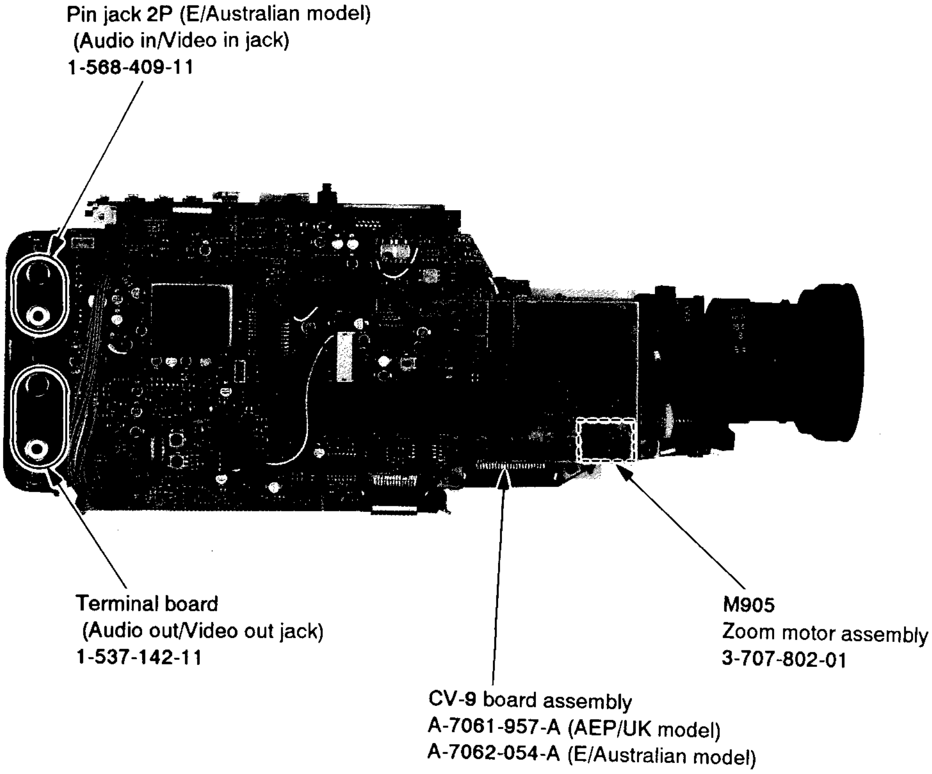

❶ Two screws
(P2×3)
❷ Two claws
❸ Remove the cassette compartment assembly in the direction of arrow.

2-12. INTERNAL VIEW

– Right Side –

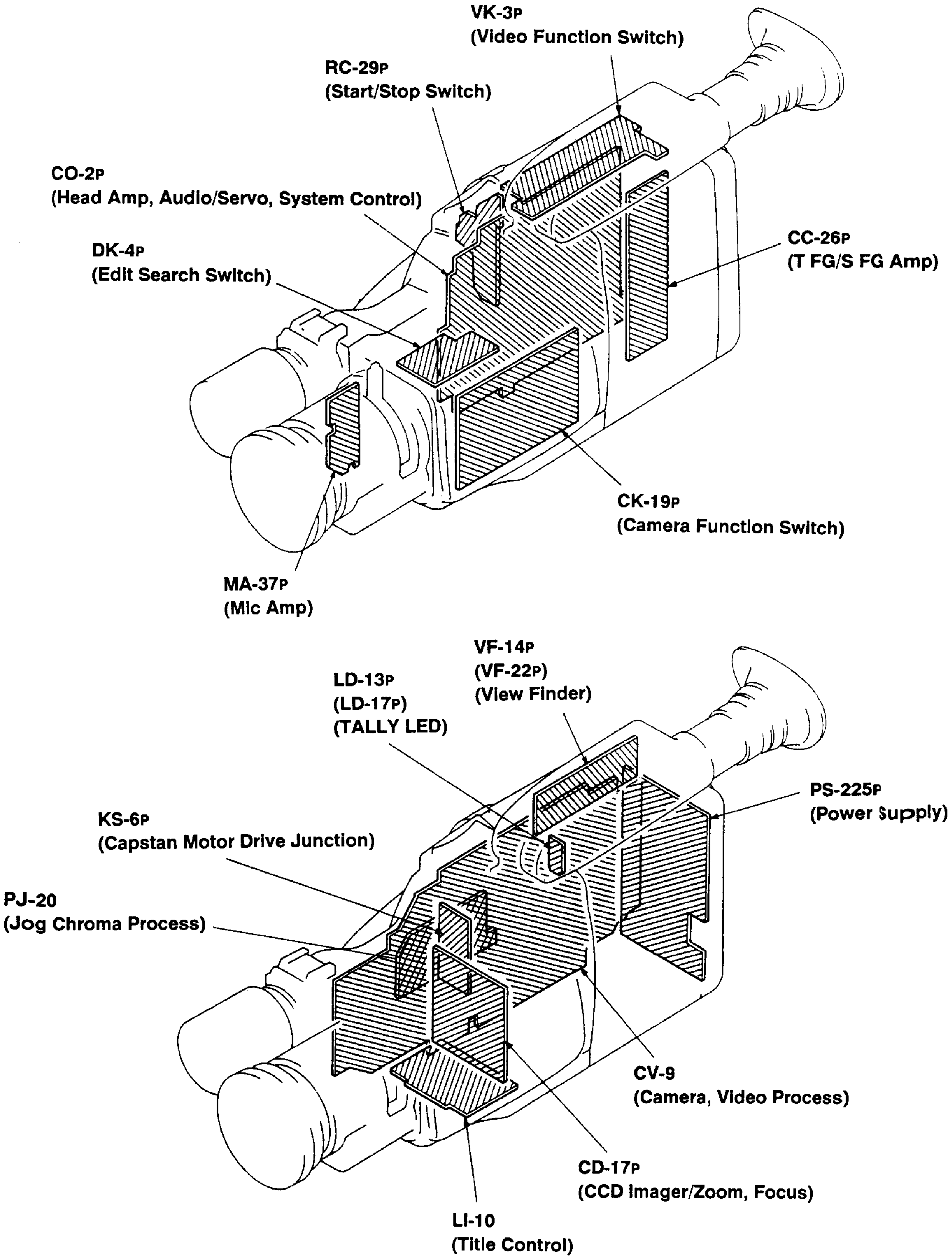

Zoom lens
(VCL-8508XB)
1-547-380-11
M902
Capstan motor assembly
8-835-331-01
Pinch roller
T reel table assembly
X-3728-854-1
D302
GL-452S
(Tape top/tape end LED)
8-719-940-81
M904
Focus motor assembly
3-707-803-01
M906
Iris motor
3-707-810-01
Drum assembly
DGU-42A-R
A-7048-235-A
S reel table assembly
X-3728-851-1
M903
Loading motor assembly
A-7040-160-A

– Left Side –

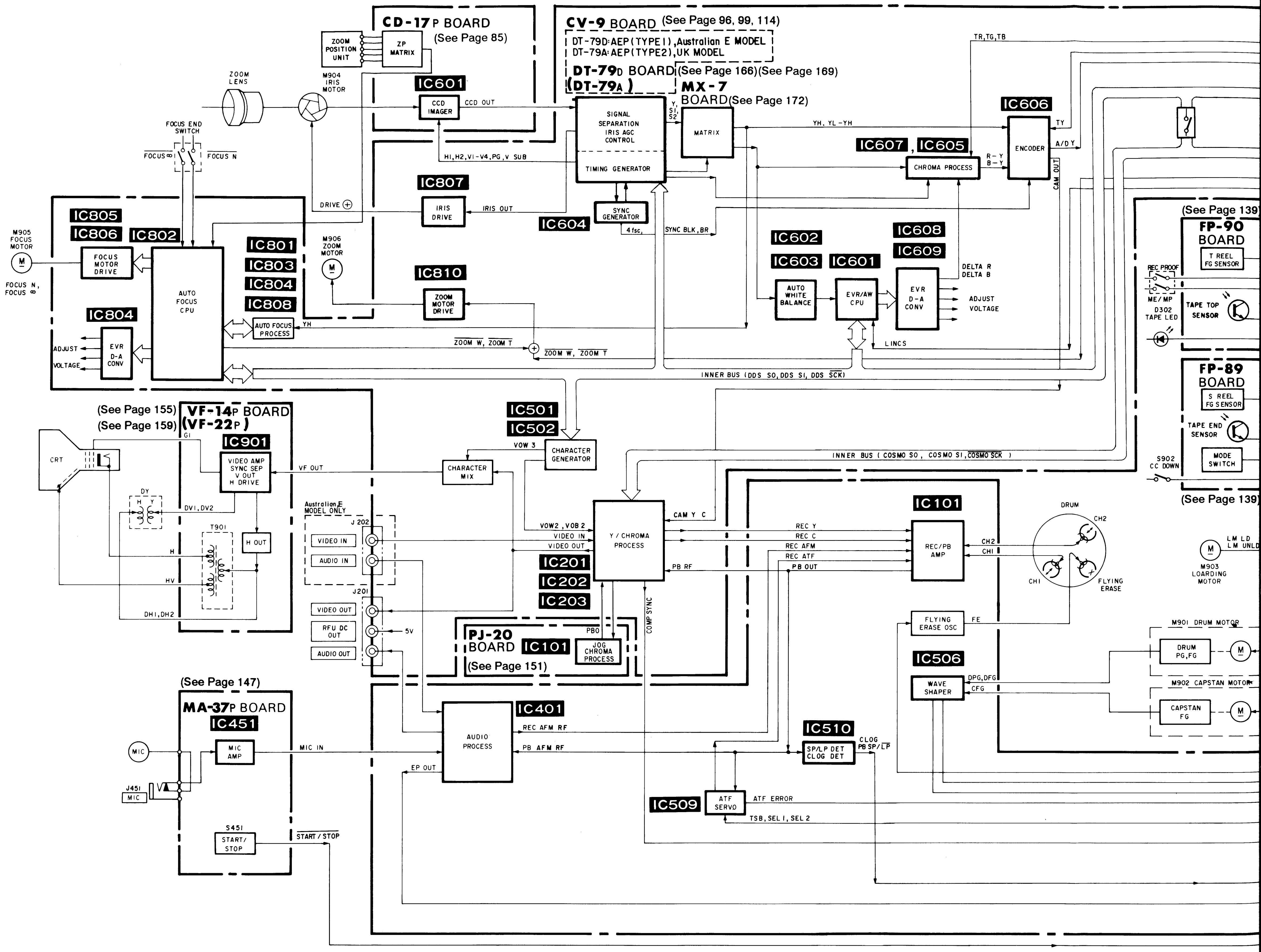

Pin jack 2P (E/Australian model)
(Audio in/Video in jack)
1-568-409-11
Terminal board
(Audio out/Video out jack)
1-537-142-11
M905
Zoom motor assembly
3-707-802-01
CV-9 board assembly
A-7061-957-A (AEP/UK model)
A-7062-054-A (E/Australian model)

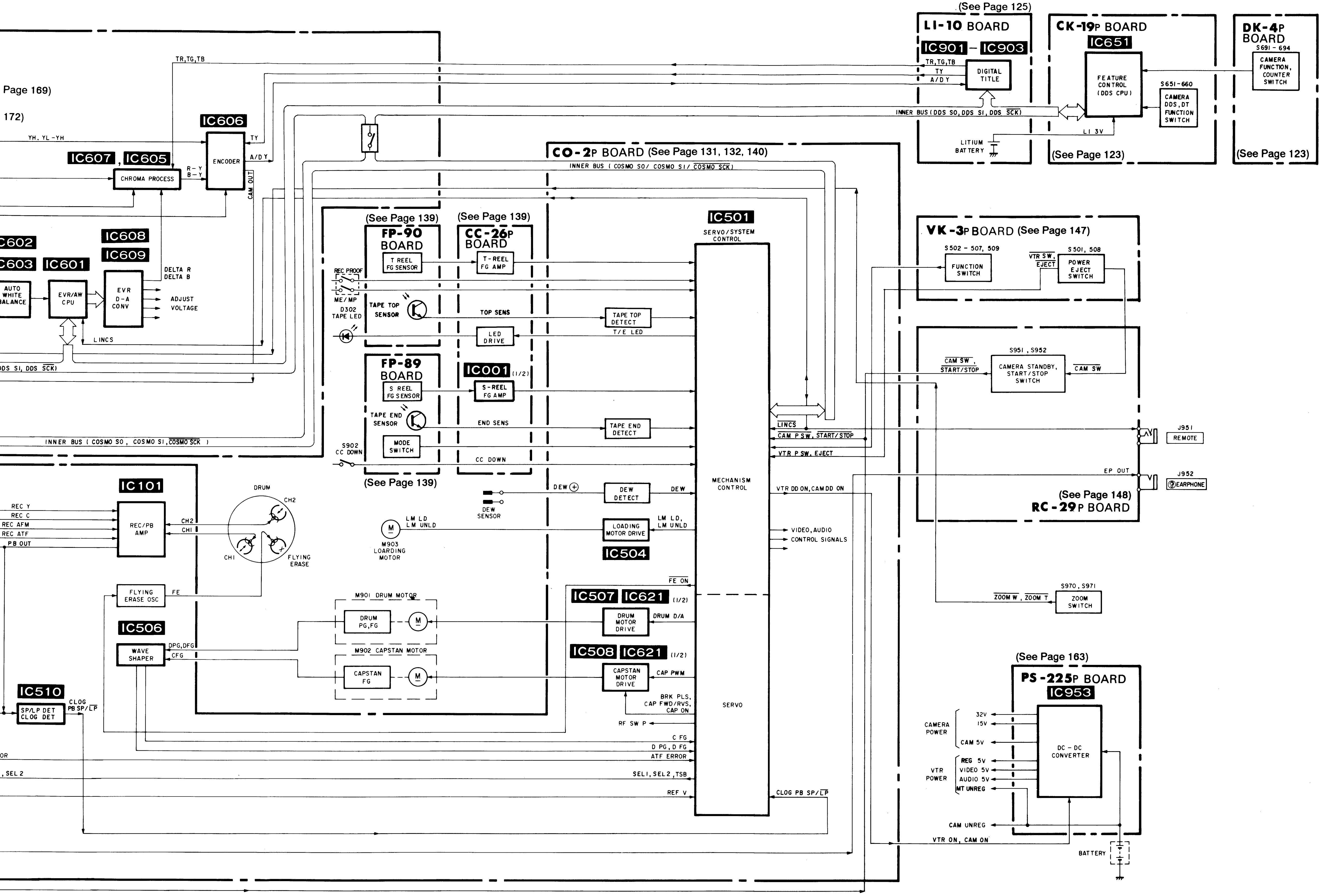
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

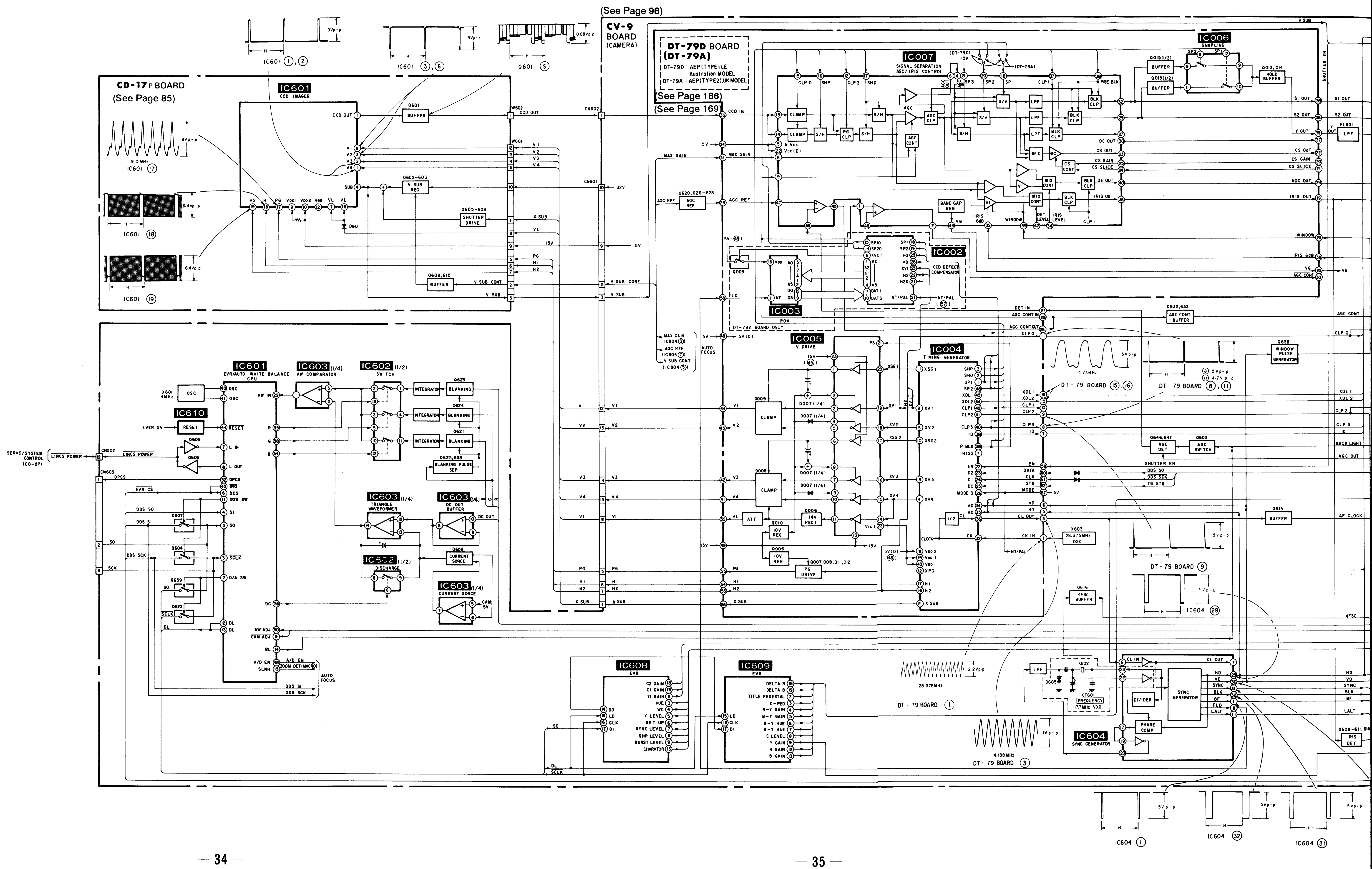

VK-3P
(Video Function Switch)
RC-29P
(Start/Stop Switch)
CO-2P
(Head Amp, Audio/Servo, System Control)
DK-4P
(Edit Search Switch)
CC-26P
(T FG/S FG Amp)
CK-19P
(Camera Function Switch)
MA-37P
(Mic Amp)
VF-14P
(VF-22P)
(View Finder)
LD-13P
(LD-17P)
(TALLY LED)
PS-225P
(Power Supply)
KS-6P
(Capstan Motor Drive Junction)
PJ-20
(Jog Chroma Process)
CV-9
(Camera, Video Process)
CD-17P
(CCD Imager/Zoom, Focus)
LI-10
(Title Control)

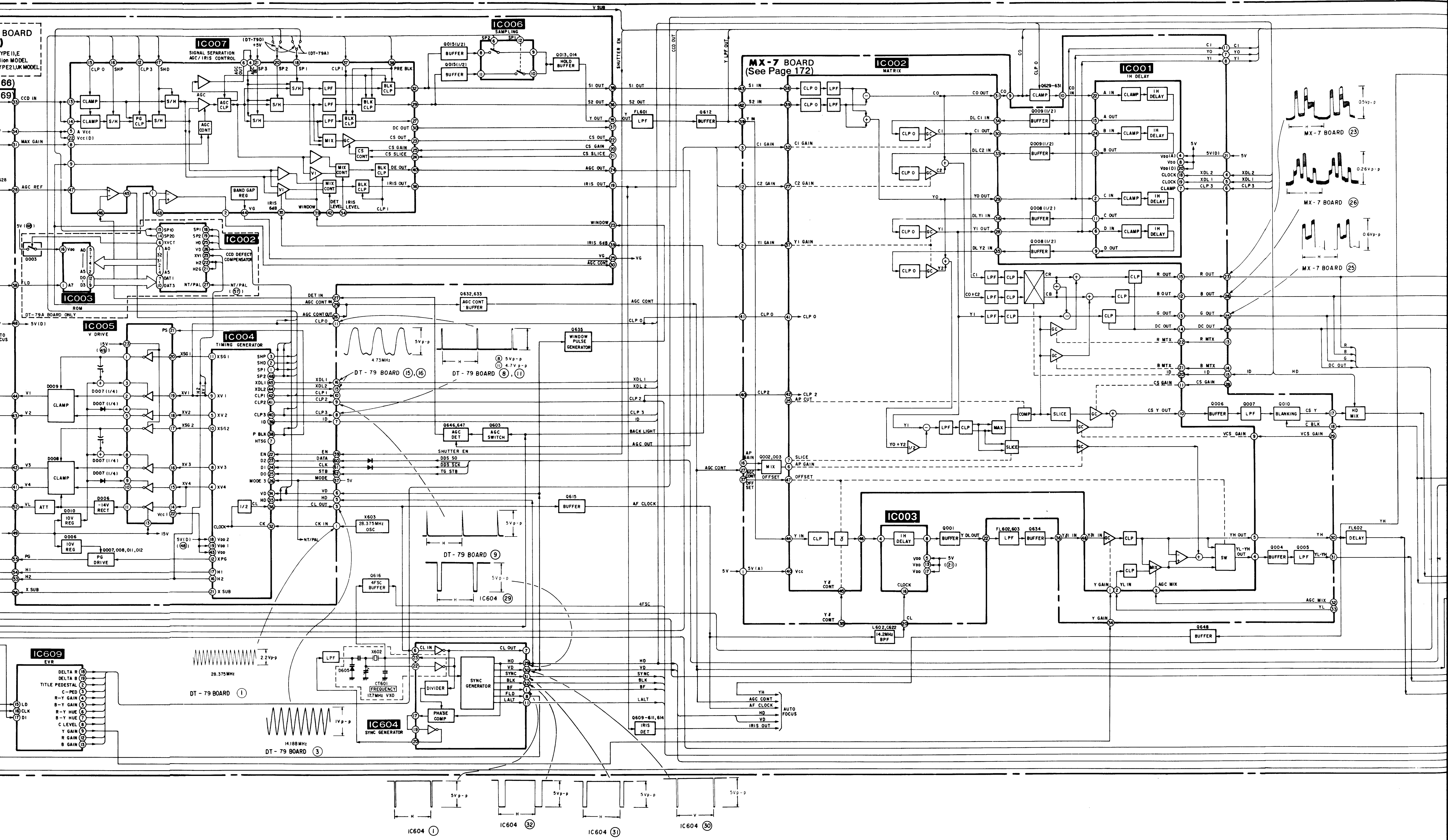
3-2. OVERALL BLOCK DIAGRAM

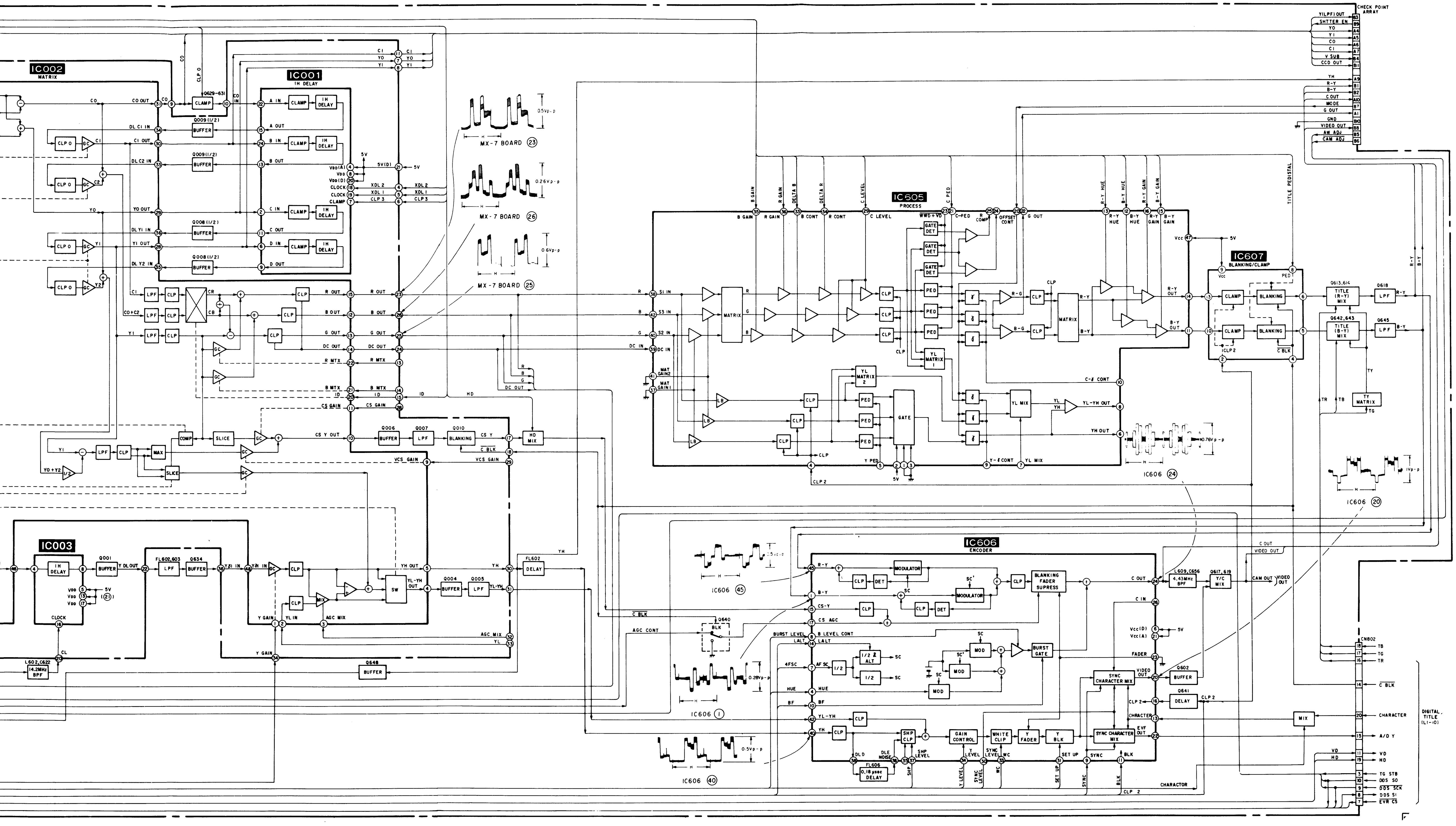

CD-17P BOARD
(See Page 85)
ZOOM POSITION UNIT
ZP MATRIX
ZOOM LENS
M904 IRIS MOTOR
IC601
CCD IMAGER
CCD OUT
FOCUS END SWITCH
FOCUS ∞
FOCUS N
H1, H2, V1-V4, PG, V SUB
IC807
DRIVE ⊕
IRIS DRIVE
IRIS OUT
CV-9 BOARD (See Page 96, 99, 114)
DT-79D: AEP (TYPE1), Australian E MODEL
DT-79A: AEP (TYPE2), UK MODEL
DT-79D BOARD (See Page 166)(See Page 169)
(DT-79A)
MX-7 BOARD (See Page 172)
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
Y, S1, S2
MATRIX
SYNC GENERATOR
IC604
4fsc
SYNC BLK, BR
YH, YL-YH
TR, TG, TB
IC606
ENCODER
TY
A/DY
CAM OUT
IC607, IC605
CHROMA PROCESS
R-Y
B-Y
IC602
IC603
IC601
AUTO WHITE BALANCE
EVR/AW CPU
IC608
IC609
EVR D-A CONV
DELTA R
DELTA B
ADJUST VOLTAGE
LINCS
INNER BUS (DDS SO, DDS SI, DDS SCK)
M905 FOCUS MOTOR
FOCUS N, FOCUS ∞
IC805
IC806
IC802
FOCUS MOTOR DRIVE
AUTO FOCUS CPU
IC801
IC803
IC804
IC808
AUTO FOCUS PROCESS
YH
M906 ZOOM MOTOR
IC810
ZOOM MOTOR DRIVE
ZOOM W, ZOOM T
IC804
EVR D-A CONV
ADJUST
VOLTAGE
(See Page 155) VF-14P BOARD
(See Page 159) (VF-22P)
CRT
G1
IC901
VIDEO AMP SYNC SEP V OUT H DRIVE
VF OUT
DY
H Y
DV1, DV2
T901
H OUT
H
HV
DH1, DH2
IC501
IC502
VOW 3
CHARACTER GENERATOR
CHARACTER MIX
INNER BUS (COSMO SO, COSMO SI, COSMO SCK)
Australian E MODEL ONLY
J202
VIDEO IN
AUDIO IN
J201
VIDEO OUT
RFU DC OUT
AUDIO OUT
5V
VOW2, VOB2
VIDEO IN
VIDEO OUT
Y/CHROMA PROCESS
CAM Y C
IC201
IC202
IC203
PB RF
COMP SYNC
PJ-20 BOARD
IC101
(See Page 151)
PBO
JOG CHROMA PROCESS
IC101
REC Y
REC C
REC AFM
REC ATF
PB OUT
REC/PB AMP
CH2
CH1
DRUM
FLYING ERASE
FLYING ERASE OSC
FE
IC506
WAVE SHAPER
DPG, DFG
CFG
(See Page 147)
MA-37P BOARD
IC451
MIC
MIC AMP
MIC IN
J451 MIC
S451
START/STOP
IC401
AUDIO PROCESS
REC AFM RF
PB AFM RF
EP OUT
IC510
SP/LP DET CLOG DET
CLOG
PB SP/LP
IC509
ATF SERVO
ATF ERROR
TSB, SEL1, SEL2
(See Page 139)
FP-90 BOARD
T REEL FG SENSOR
REC PROOF
ME/MP
D302 TAPE LED
TAPE TOP SENSOR
FP-89 BOARD
S REEL FG SENSOR
TAPE END SENSOR
S902 CC DOWN
MODE SWITCH
(See Page 139)
LM LD
LM UNLD
M903 LOARDING MOTOR
M901 DRUM MOTOR
DRUM PG, FG
M902 CAPSTAN MOTOR
CAPSTAN FG


Page 169)
172)
TR,TG,TB
YH, YL -YH
IC606
ENCODER
TY
A/D Y
CAM OUT
IC607 , IC605
CHROMA PROCESS
R - Y
B - Y
IC602
IC603
IC601
AUTO WHITE BALANCE
EVR/AW CPU
IC608
IC609
EVR D-A CONV
DELTA R
DELTA B
ADJUST VOLTAGE
LINCS
DDS SI, DDS SCK)
INNER BUS (COSMO SO, COSMO SI, COSMO SCK)
(See Page 125)
LI-10 BOARD
IC901 - IC903
TR,TG,TB
TY
A/D Y
DIGITAL TITLE
INNER BUS (DDS SO, DDS SI, DDS SCK)
LITIUM BATTERY
CK-19P BOARD
IC651
FEATURE CONTROL (DDS CPU)
S651-660
CAMERA DDS,DT FUNCTION SWITCH
LI 3V
(See Page 123)
DK-4P BOARD
S691 - 694
CAMERA FUNCTION, COUNTER SWITCH
(See Page 123)
CO-2P BOARD (See Page 131, 132, 140)
INNER BUS (COSMO SO/ COSMO SI/ COSMO SCK)
(See Page 139)
FP-90 BOARD
T REEL FG SENSOR
(See Page 139)
CC-26P BOARD
T-REEL FG AMP
REC PROOF
ME/MP
D302 TAPE LED
TAPE TOP SENSOR
TOP SENS
TAPE TOP DETECT
T/E LED
LED DRIVE
FP-89 BOARD
S REEL FG SENSOR
IC001 (1/2)
S-REEL FG AMP
TAPE END SENSOR
END SENS
TAPE END DETECT
MODE SWITCH
S902 CC DOWN
CC DOWN
(See Page 139)
IC501
SERVO/SYSTEM CONTROL
MECHANISM CONTROL
SERVO
LINCS
CAM P SW, START/STOP
VTR P SW, EJECT
VTR DD ON, CAM DD ON
VIDEO, AUDIO CONTROL SIGNALS
CLOG PB SP/LP
DEW
DEW SENSOR
DEW DETECT
M903 LOADING MOTOR
LM LD
LM UNLD
LOADING MOTOR DRIVE
IC504
FE ON
IC507 IC621 (1/2)
DRUM MOTOR DRIVE
DRUM D/A
IC508 IC621 (1/2)
CAPSTAN MOTOR DRIVE
CAP PWM
BRK PLS, CAP FWD/RVS, CAP ON
RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2, TSB
REF V
M901 DRUM MOTOR
DRUM PG,FG
M902 CAPSTAN MOTOR
CAPSTAN FG
IC101
REC Y
REC C
REC AFM
REC ATF
PB OUT
REC/PB AMP
CH2
CH1
DRUM
CH2
CH1
FLYING ERASE
FLYING ERASE OSC
FE
IC506
WAVE SHAPER
DPG,DFG
CFG
IC510
SP/LP DET CLOG DET
CLOG PB SP/LP
OR
, SEL 2
VK-3P BOARD (See Page 147)
S502 - 507, 509
FUNCTION SWITCH
VTR SW, EJECT
S501, 508
POWER EJECT SWITCH
S951, S952
CAM SW, START/STOP
CAMERA STANDBY, START/STOP SWITCH
CAM SW
J951
REMOTE
EP OUT
J952
EARPHONE
(See Page 148)
RC-29P BOARD
S970, S971
ZOOM W, ZOOM T
ZOOM SWITCH
(See Page 163)
PS-225P BOARD
IC953
DC - DC CONVERTER
CAMERA POWER
32V
15V
CAM 5V
VTR POWER
REG 5V
VIDEO 5V
AUDIO 5V
MT UNREG
CAM UNREG
VTR ON, CAM ON
BATTERY

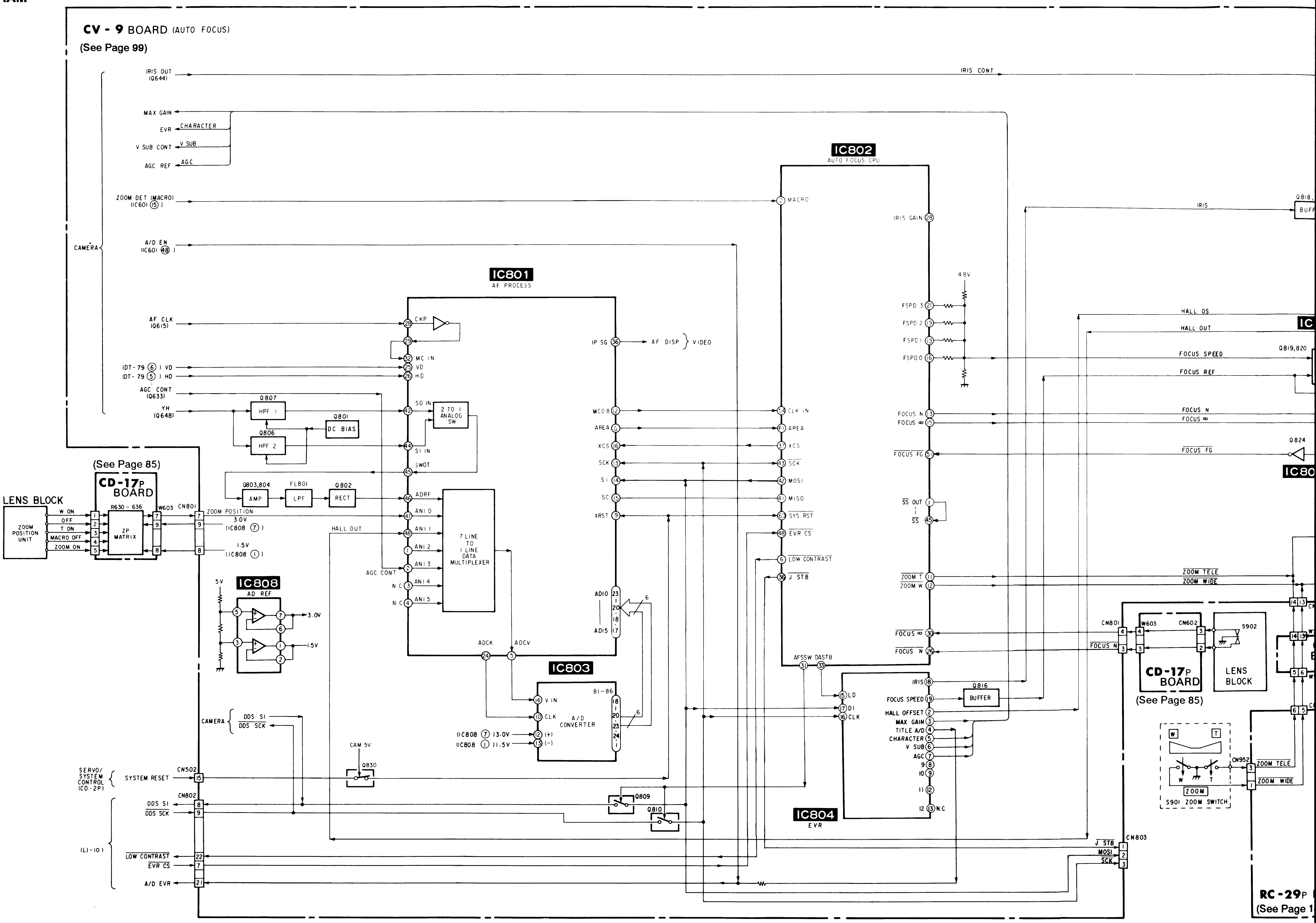
3-3. CAMERA BLOCK DIAGRAM


CD-17P BOARD
(See Page 85)
CV-9 BOARD (CAMERA)
(See Page 96)
DT-79D BOARD
(DT-79A)
DT-79D : AEP(TYPE1),E Australion MODEL
DT-79A : AEP(TYPE2),UK MODEL
(See Page 166)
(See Page 169)
IC601 CCD IMAGER
Q601 BUFFER
Q602-603 V SUB REG
Q605-608 SHUTTER DRIVE
Q609,610 BUFFER
IC601 EVR/AUTO WHITE BALANCE CPU
IC603 (1/4) AW COMPARATOR
IC602 (1/2) SWITCH
IC610 RESET
IC603 (1/4) TRIANGLE WAVEFORMER
IC603 (1/4) DC OUT BUFFER
IC602 (1/2) DISCHARGE
IC603 (1/4) CURRENT SORCE
Q608 CURRENT SORCE
Q625,638 BLANKING PULSE SEP
INTEGRATOR
BLANKING
X601 4MHz OSC
SERVO/SYSTEM CONTROL (CO-2P)
LINCS POWER
IC007 SIGNAL SEPARATION AGC/IRIS CONTROL
IC006 SAMPLING
Q015(1/2) BUFFER
Q013,014 HOLD BUFFER
IC002 CCD DEFECT COMPENSATOR
IC003 ROM
DT-79A BOARD ONLY
IC005 V DRIVE
IC004 TIMING GENERATOR
Q620,626-628 AGC REF
Q632,633 AGC CONT BUFFER
Q635 WINDOW PULSE GENERATOR
Q646,647 AGC DET
Q603 AGC SWITCH
Q615 BUFFER
Q616 4FSC BUFFER
X603 28.375MHz OSC
IC608 EVR
IC609 EVR
IC604 SYNC GENERATOR
SYNC GENERATOR
DIVIDER
PHASE COMP
X602
CT601 FREQUENCY
17.7MHz VXO
D605
LPF
FL601 LPF
Q609-611,614 IRIS DET
BAND GAP REG
Q009 CLAMP
Q008 CLAMP
D007 (1/4)
Q010 10V REG
Q006 10V REG
D006 -14V RECT
Q007,008,011,012 PG DRIVE
ATT
AUTO FOCUS
9Vp-p
IC601 ①,②
IC601 ③,⑥
0.68Vp-p
Q601 ⑤
9.5MHz
IC601 ⑰
6.4Vp-p
IC601 ⑱
IC601 ⑲
4.73MHz
5Vp-p
DT-79 BOARD ⑮,⑯
DT-79 BOARD ⑧,⑪
⑧ 5Vp-p
⑪ 4.7Vp-p
DT-79 BOARD ⑨
IC604 ㉙
28.375MHz
2.2Vp-p
DT-79 BOARD ①
14.188MHz
1Vp-p
DT-79 BOARD ③
IC604 ①
IC604 ㉜
IC604 ㉛
S1 OUT
S2 OUT
Y OUT
CS GAIN
CS SLICE
AGC OUT
IRIS OUT
WINDOW
IRIS 6dB
VG
AGC CONT
CLP 0
XDL 1
XDL 2
CLP 2
CLP 3
ID
BACK LIGHT
SHUTTER EN
AF CLOCK
4FSC
HD
VD
SYNC
BLK
BF
LALT
V SUB

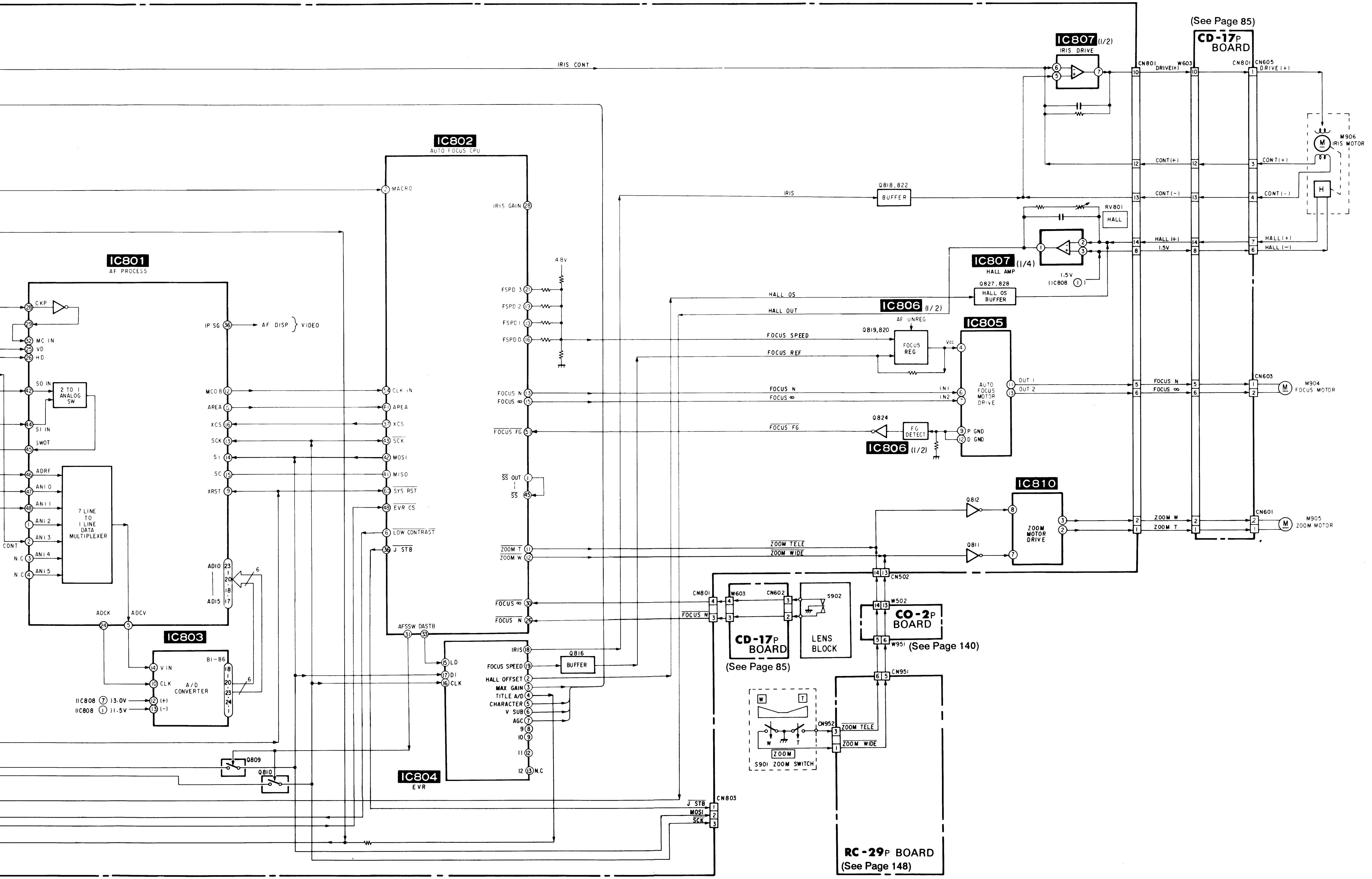

IC006 SAMPLING
IC007 SIGNAL SEPARATION AGC/IRIS CONTROL
IC002 CCD DEFECT COMPENSATOR
IC003 ROM
IC005 V DRIVE
IC004 TIMING GENERATOR
IC609 EVR
IC604 SYNC GENERATOR
MX-7 BOARD (See Page 172)
IC002 MATRIX
IC001 1H DELAY
IC003 1H DELAY
HOLD BUFFER
WINDOW PULSE GENERATOR
AGC CONT BUFFER
AGC DET
AGC SWITCH
28.375MHz OSC
4FSC BUFFER
SYNC GENERATOR
DIVIDER
PHASE COMP
IRIS DET
14.2MHz BPF
AUTO FOCUS
DT-79A BOARD ONLY
DT-79 BOARD ⑮, ⑯
DT-79 BOARD ⑧, ⑪
DT-79 BOARD ⑨
DT-79 BOARD ①
DT-79 BOARD ③
IC604 ㉙
IC604 ①
IC604 ㉜
IC604 ㉛
IC604 ㉚
MX-7 BOARD ㉓
MX-7 BOARD ㉖
MX-7 BOARD ㉕
4.73MHz
28.375MHz
14.188MHz
5Vp-p
2.2Vp-p
1Vp-p
0.5Vp-p
0.26Vp-p
0.6Vp-p
CT601 FREQUENCY 17.7MHz VXO


IC002
MATRIX
IC001
1H DELAY
IC003
IC605
PROCESS
IC606
ENCODER
IC607
BLANKING/CLAMP
CHECK POINT ARRAY
Y(LPF) OUT B3
SHTTER EN B9
YO A4
Y1 A5
CO A6
C1 A7
V SUB B4
CCD OUT B11
YH A9
R-Y B1
B-Y B2
C OUT A10
MODE B7
G OUT A1
GND B10
VIDEO OUT B8
AW ADJ B5
CAM ADJ B6
MX-7 BOARD ㉓
0.5Vp-p
MX-7 BOARD ㉖
0.26Vp-p
MX-7 BOARD ㉕
0.6Vp-p
IC606 ㉔
0.76Vp-p
IC606 ⑳
1Vp-p
IC606 (45)
IC606 ①
0.28Vp-p
IC606 (40)
0.5Vp-p
CLAMP
1H DELAY
BUFFER
CLP
LPF
GC
SLICE
COMP
MAX
BLANKING
HD MIX
SW
YL-YH OUT
DELAY
MATRIX
YL MATRIX 1
YL MATRIX 2
GATE DET
PED
GATE
YL MIX
TITLE (R-Y) MIX
TITLE (B-Y) MIX
TY MATRIX
MODULATOR
BLANKING FADER SUPRESS
4.43MHz BPF
Y/C MIX
CAM OUT
VIDEO OUT
BURST GATE
SYNC CHARACTER MIX
SHP CLP
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
FL606 0.18μsec DELAY
L602,C622 14.2MHz BPF
Q640 BLK
CN802
18 TB
17 TG
16 TR
14 C BLK
20 CHARACTER
15 A/D Y
11 VD
19 HD
3 TG STB
10 DDS SO
9 DDS SCK
8 DDS SI
7 EVR CS
DIGITAL TITLE (L1-10)

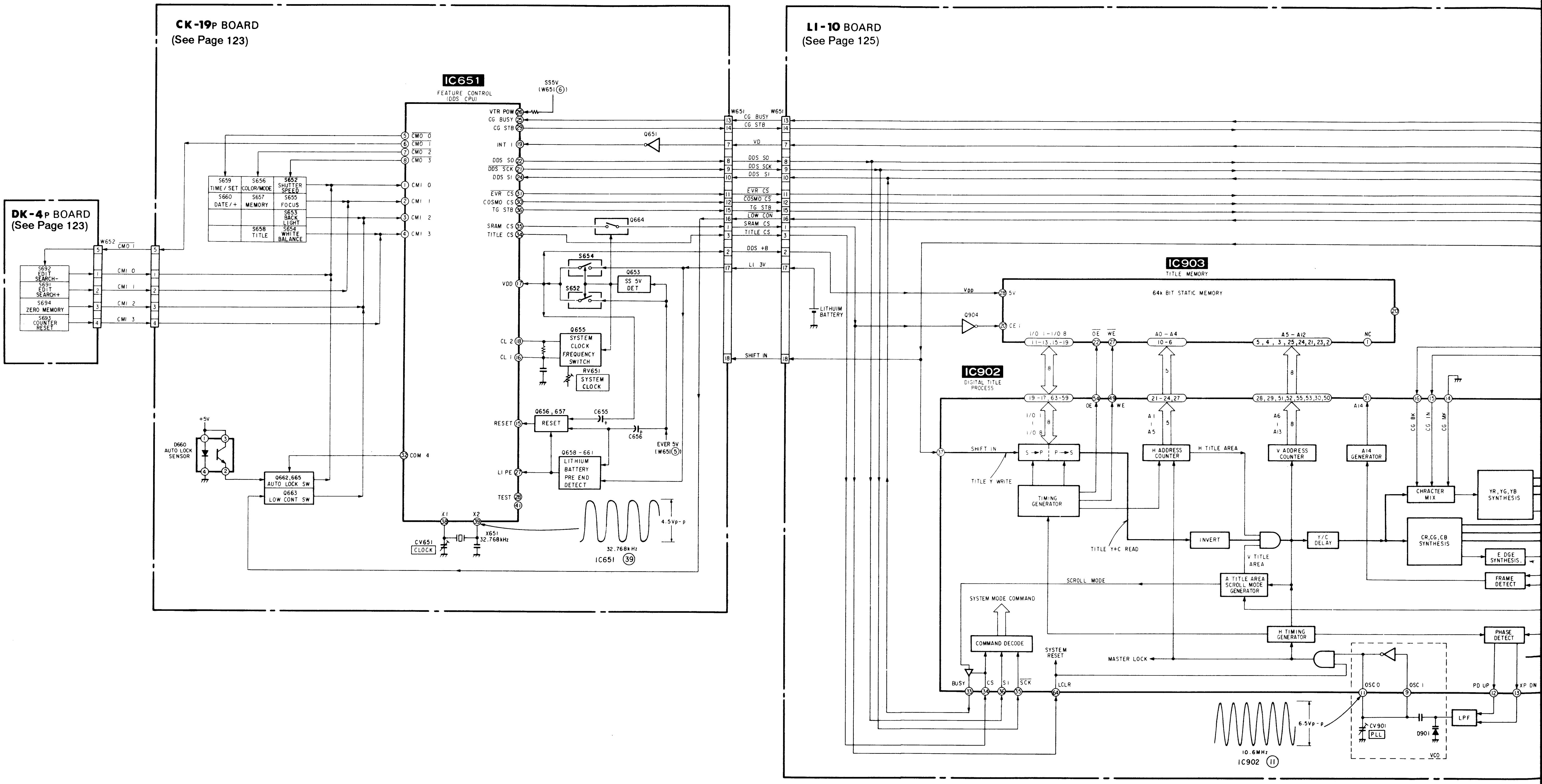
3-4. AUTO FOCUS BLOCK DIAGRAM

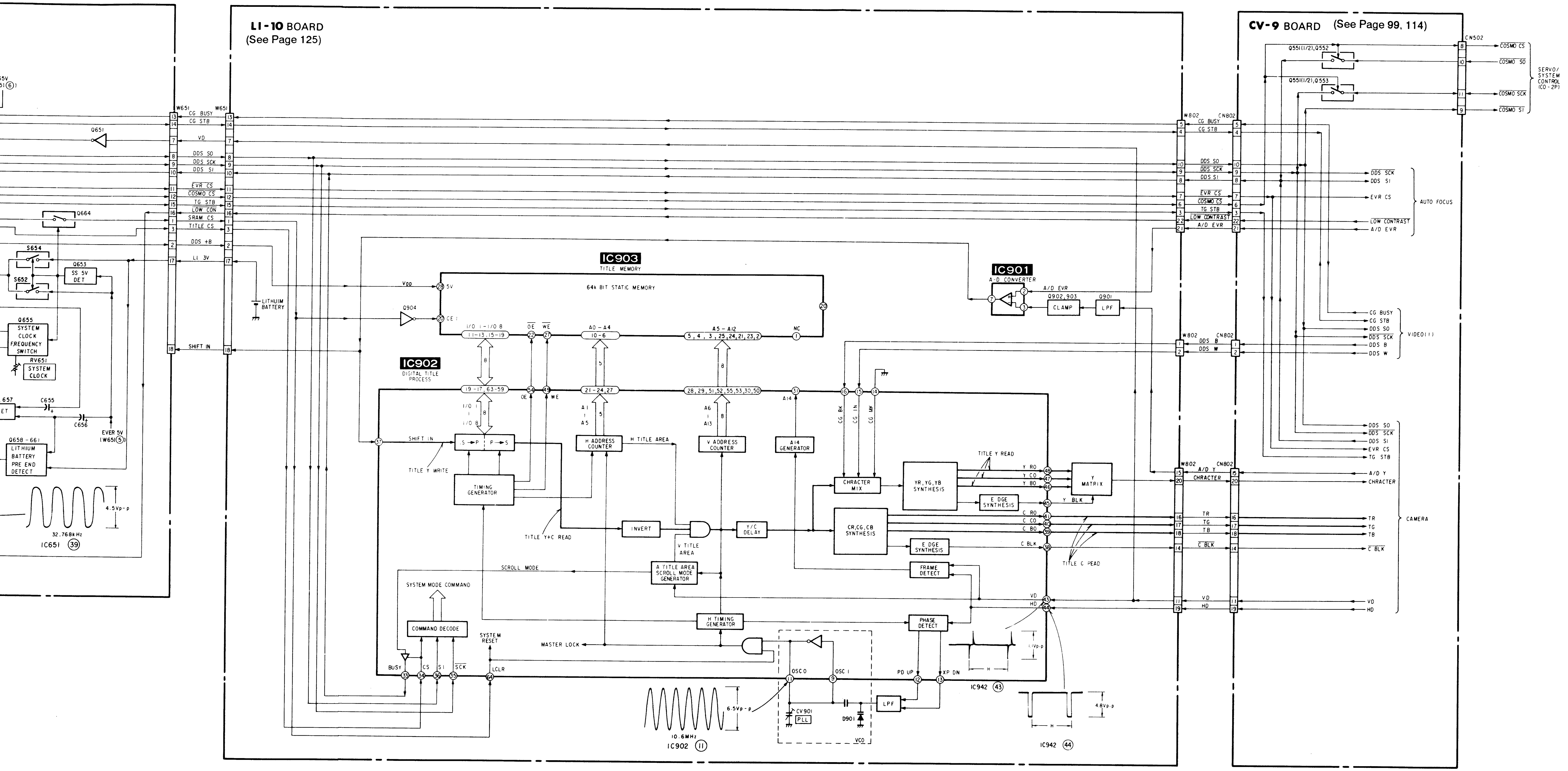


CV - 9 BOARD (AUTO FOCUS)
(See Page 99)
CAMERA
IRIS OUT (Q644)
MAX GAIN
EVR
CHARACTER
V SUB CONT
V SUB
AGC REF
AGC
ZOOM DET (MACRO) (IC601 ⑮)
A/D EN (IC601 ㊽)
AF CLK (Q615)
(DT-79 ⑥) VD
(DT-79 ⑤) HD
AGC CONT (Q633)
YH (Q648)
IRIS CONT
IC801
AF PROCESS
CKP
MC IN
VD
HD
SO IN
SI IN
SWOT
ADRF
ANI 0
ANI 1
ANI 2
ANI 3
ANI 4
ANI 5
N.C
AGC CONT
2 TO 1 ANALOG SW
7 LINE TO 1 LINE DATA MULTIPLEXER
IP SG
AF DISP
VIDEO
MCO 8
AREA
XCS
SCK
SI
SO
XRST
ADI0
ADI5
ADCK
ADCV
Q807
HPF 1
Q806
HPF 2
Q801
DC BIAS
Q803,804
AMP
FL801
LPF
Q802
RECT
IC802
AUTO FOCUS CPU
MACRO
IRIS GAIN
4.8V
FSPD 3
FSPD 2
FSPD 1
FSPD 0
FOCUS N
FOCUS ∞
FOCUS FG
SS OUT
SS
ZOOM T
ZOOM W
CLK IN
AREA
XCS
SCK
MOSI
MISO
SYS RST
EVR CS
LOW CONTRAST
J STB
AFSSW
DASTB
IRIS
Q818
BUFF
HALL OS
HALL OUT
FOCUS SPEED
FOCUS REF
Q819,820
FOCUS N
FOCUS ∞
FOCUS FG
Q824
ZOOM TELE
ZOOM WIDE
IC803
A/D CONVERTER
V IN
CLK
B1 - B6
(IC808 ⑦) 3.0V
(IC808 ①) 1.5V
(+)
(-)
IC804
EVR
LD
DI
CLK
IRIS
FOCUS SPEED
HALL OFFSET
MAX GAIN
TITLE A/D
CHARACTER
V SUB
AGC
N.C
Q816
BUFFER
IC808
AD REF
5V
3.0V
1.5V
(See Page 85)
LENS BLOCK
ZOOM POSITION UNIT
W ON
OFF
T ON
MACRO OFF
ZOOM ON
CD-17P BOARD
R630 - 636
ZP MATRIX
W603
CN801
ZOOM POSITION
3.0V (IC808 ⑦)
1.5V (IC808 ①)
HALL OUT
CAMERA
DDS SI
DDS SCK
CAM 5V
Q830
SERVO/ SYSTEM CONTROL (CO-2P)
SYSTEM RESET
CN502
CN802
(L1-10)
DDS SI
DDS SCK
LOW CONTRAST
EVR CS
A/D EVR
Q809
Q810
CN801
W603
CN602
FOCUS ∞
FOCUS N
S902
CD-17P BOARD
(See Page 85)
LENS BLOCK
W
T
ZOOM
S901 ZOOM SWITCH
CN952
ZOOM TELE
ZOOM WIDE
CN803
J STB
MOSI
SCK
RC-29P
(See Page 1
IC
IC80


IC801
AF PROCESS
CKP
MC IN
VD
HD
SO IN
2 TO 1 ANALOG SW
SI IN
SWOT
ADRF
ANI 0
ANI 1
ANI 2
ANI 3
ANI 4
ANI 5
7 LINE TO 1 LINE DATA MULTIPLEXER
CONT
N.C
IP SG
AF DISP
VIDEO
MCO 8
AREA
XCS
SCK
SI
SC
XRST
ADI0
ADI5
ADCK
ADCV
IC803
A/D CONVERTER
V IN
CLK
B1-B6
(IC808 ⑦)3.0V
(IC808 ①)1.5V
(+)
(-)
Q809
Q810
IC802
AUTO FOCUS CPU
MACRO
IRIS GAIN
4.8V
FSPD 3
FSPD 2
FSPD 1
FSPD 0
CLK IN
AREA
XCS
SCK
MOSI
MISO
SYS RST
EVR CS
LOW CONTRAST
J STB
FOCUS N
FOCUS ∞
FOCUS FG
SS OUT
SS
ZOOM T
ZOOM W
FOCUS ∞
FOCUS N
AFSSW DASTB
IC804
EVR
LD
DI
CLK
IRIS
FOCUS SPEED
HALL OFFSET
MAX GAIN
TITLE A/D
CHARACTER
V SUB
AGC
N.C
Q816
BUFFER
IRIS CONT
IRIS
Q818, 822
BUFFER
HALL OS
HALL OUT
FOCUS SPEED
FOCUS REF
FOCUS N
FOCUS ∞
FOCUS FG
ZOOM TELE
ZOOM WIDE
IC807 (1/2)
IRIS DRIVE
IC807 (1/4)
HALL AMP
RV801
HALL
1.5V
(IC808 ①)
Q827, 828
HALL OS BUFFER
IC806 (1/2)
AF UNREG
Q819, 820
FOCUS REG
Vcc
IC805
AUTO FOCUS MOTOR DRIVE
IN1
IN2
OUT 1
OUT 2
P GND
D GND
Q824
FG DETECT
IC806 (1/2)
IC810
Q812
Q811
ZOOM MOTOR DRIVE
CN801
DRIVE(+)
CONT(+)
CONT(-)
HALL(+)
1.5V
FOCUS N
FOCUS ∞
ZOOM W
ZOOM T
W603
(See Page 85)
CD-17P BOARD
CN801
CN605
DRIVE(+)
CONT(+)
CONT(-)
HALL(+)
HALL(-)
M906
IRIS MOTOR
H
CN603
M904
FOCUS MOTOR
CN601
M905
ZOOM MOTOR
CN502
W502
CO-2P BOARD
W951
(See Page 140)
CN801
FOCUS N
W603
CN602
CD-17P BOARD
(See Page 85)
S902
LENS BLOCK
CN951
CN952
ZOOM TELE
ZOOM WIDE
W
T
ZOOM
S901 ZOOM SWITCH
RC-29P BOARD
(See Page 148)
CN803
J STB
MOSI
SCK

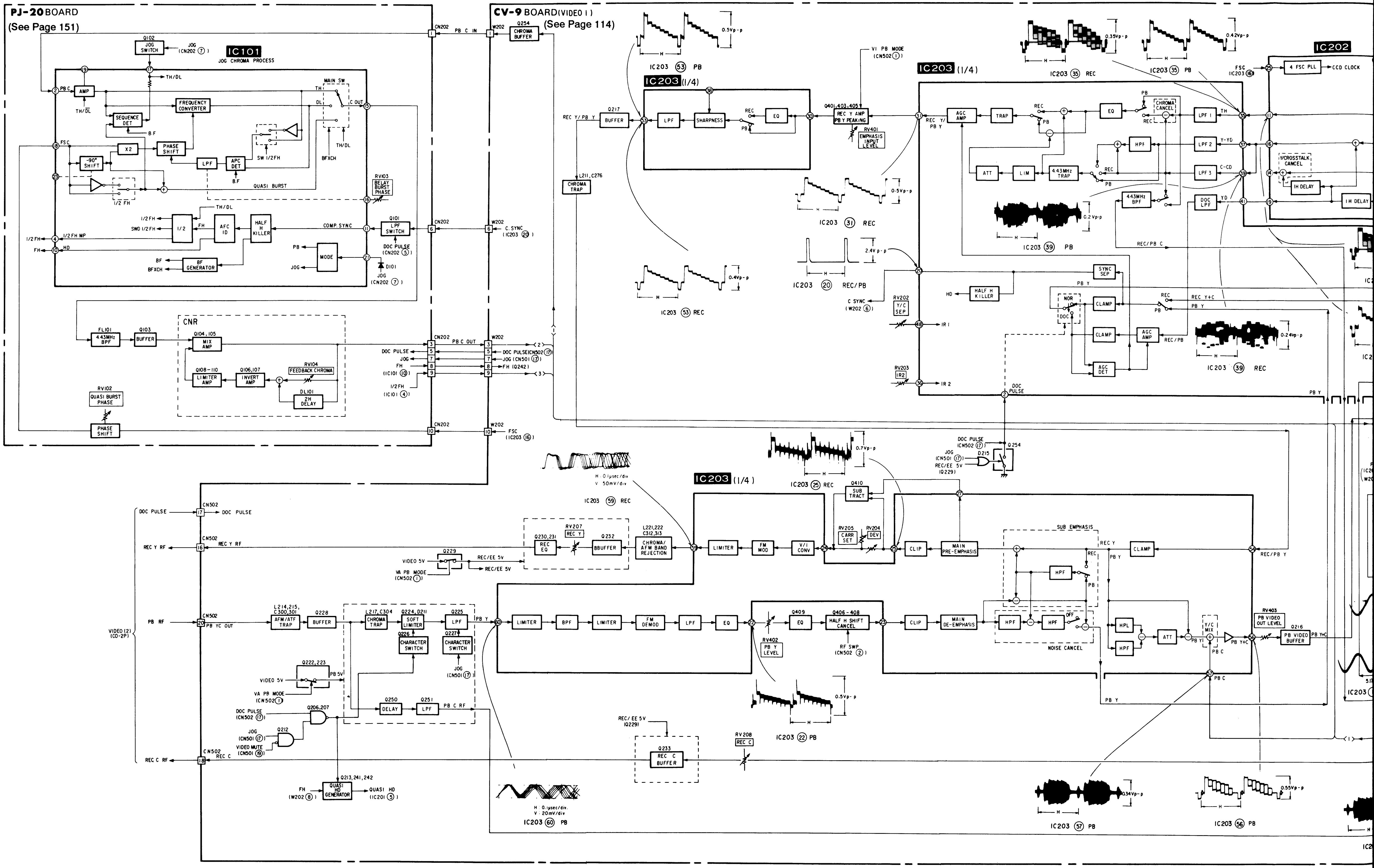
3-5. DIGITAL TITLE BLOCK DIAGRAM

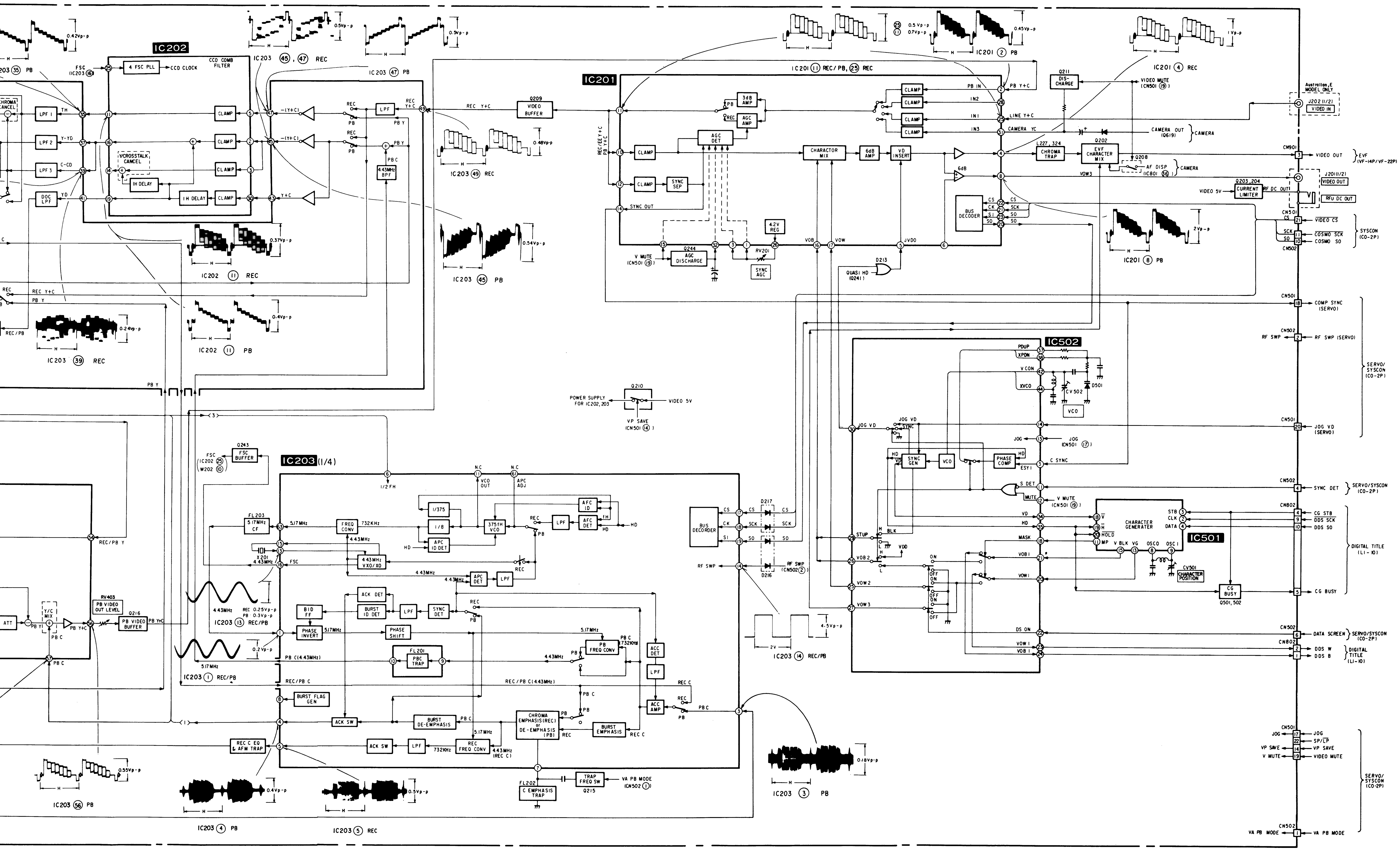

CK-19P BOARD
(See Page 123)
LI-10 BOARD
(See Page 125)
DK-4P BOARD
(See Page 123)
IC651
FEATURE CONTROL
(DDS CPU)
IC903
TITLE MEMORY
64k BIT STATIC MEMORY
IC902
DIGITAL TITLE PROCESS
S692 EDIT SEARCH-
S691 EDIT SEARCH+
S694 ZERO MEMORY
S693 COUNTER RESET
S659 TIME / SET
S656 COLOR/MODE
S652 SHUTTER SPEED
S660 DATE / +
S657 MEMORY
S655 FOCUS
S653 BACK LIGHT
S658 TITLE
S654 WHITE BALANCE
VTR POW
CG BUSY
CG STB
INT 1
DDS SO
DDS SCK
DDS SI
EVR CS
COSMO CS
TG STB
SRAM CS
TITLE CS
VDD
CL 2
CL 1
RESET
LI PE
TEST
X1
X2
CMO 0
CMO 1
CMO 2
CMO 3
CMI 0
CMI 1
CMI 2
CMI 3
COM 4
SS5V (W651 ⑥)
Q651
Q664
S654
S652
Q653 SS 5V DET
Q655 SYSTEM CLOCK FREQUENCY SWITCH
RV651 SYSTEM CLOCK
Q656, 657 RESET
C655
C656
EVER 5V (W651 ⑤)
Q658 - 661 LITHIUM BATTERY PRE END DETECT
D660 AUTO LOCK SENSOR
+5V
Q662, 665 AUTO LOCK SW
Q663 LOW CONT SW
CV651 CLOCK
X651 32.768kHz
4.5Vp-p
32.768kHz
IC651 (39)
W652
W651
CG BUSY
CG STB
VD
DDS SO
DDS SCK
DDS SI
EVR CS
COSMO CS
TG STB
LOW CON
SRAM CS
TITLE CS
DDS +B
LI 3V
SHIFT IN
LITHUIM BATTERY
Q904
VDD
5V
CE 1
I/O 1 - I/O 8
OE
WE
A0 - A4
A5 - A12
NC
A14
OE
WE
A1 - A5
A6 - A13
CG BK
CG IN
CG YM
SHIFT IN
TITLE Y WRITE
S→P P→S
TIMING GENERATOR
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A14 GENERATOR
CHRACTER MIX
YR, YG, YB SYNTHESIS
CR, CG, CB SYNTHESIS
EDGE SYNTHESIS
FRAME DETECT
INVERT
Y/C DELAY
TITLE Y+C READ
V TITLE AREA
A TITLE AREA SCROLL MODE GENERATOR
SCROLL MODE
SYSTEM MODE COMMAND
COMMAND DECODE
SYSTEM RESET
MASTER LOCK
H TIMING GENERATOR
PHASE DETECT
BUSY
CS
SI
SCK
LCLR
OSC O
OSC I
PD UP
XP DN
CV901 PLL
D901
LPF
VCO
6.5Vp-p
10.6MHz
IC902 (11)



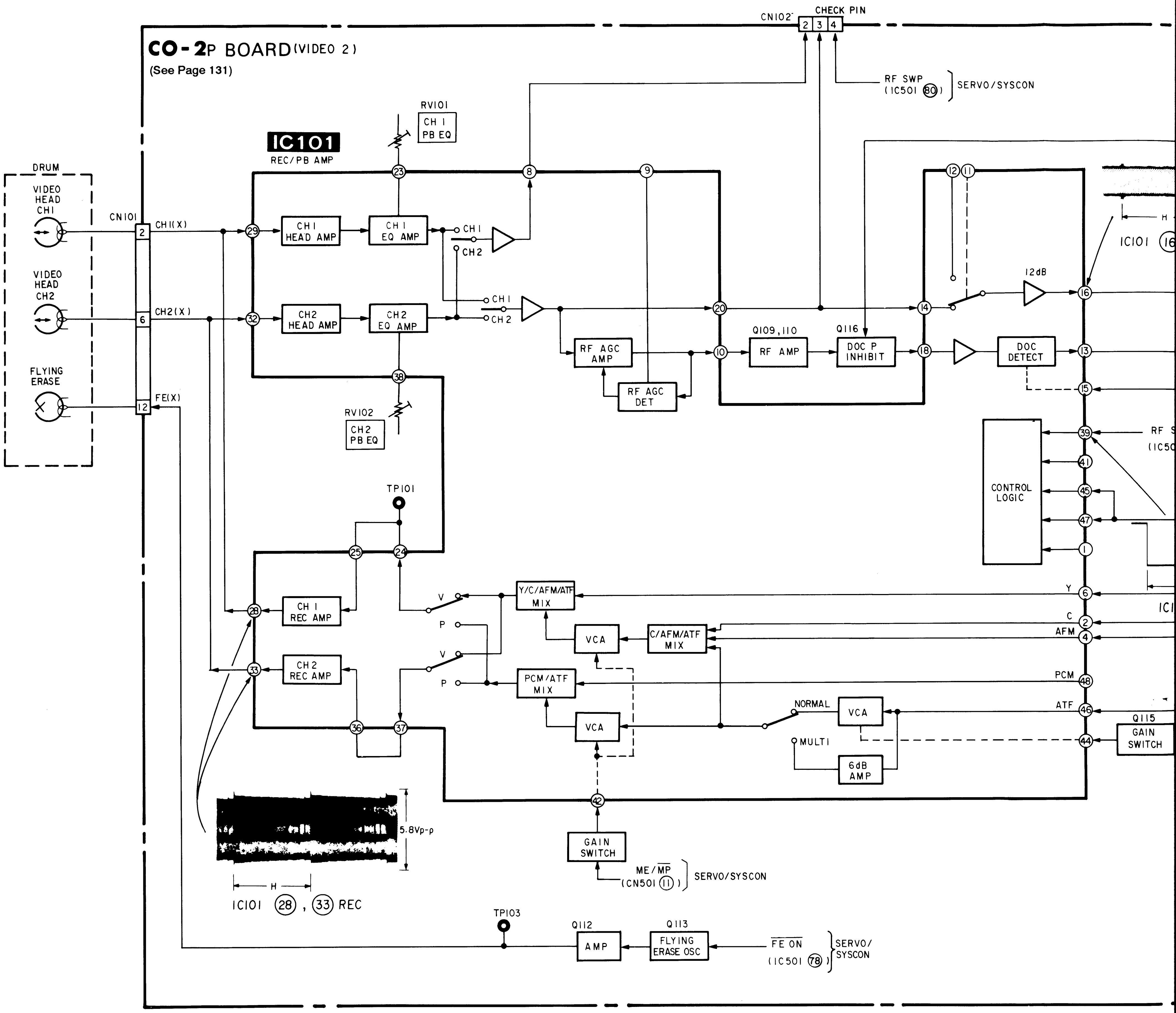
LI-10 BOARD
(See Page 125)
CV-9 BOARD (See Page 99, 114)
IC903
TITLE MEMORY
64k BIT STATIC MEMORY
IC902
DIGITAL TITLE PROCESS
IC901
A-D CONVERTER
W651
CG BUSY
CG STB
VD
DDS SO
DDS SCK
DDS SI
EVR CS
COSMO CS
TG STB
LOW CON
SRAM CS
TITLE CS
DDS +B
LI 3V
SHIFT IN
Q651
Q664
S654
S652
Q653
SS 5V DET
Q655
SYSTEM CLOCK FREQUENCY SWITCH
RV651
SYSTEM CLOCK
C655
C656
EVER 5V (W651⑤)
Q658-661
LITHIUM BATTERY PRE END DETECT
4.5Vp-p
32.768kHz
IC651 ㊴
LITHUIM BATTERY
VDD
Q904
I/O 1 - I/O 8
OE
WE
A0 - A4
A5 - A12
NC
TIMING GENERATOR
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A14 GENERATOR
TITLE Y WRITE
TITLE Y+C READ
INVERT
Y/C DELAY
V TITLE AREA
A TITLE AREA SCROLL MODE GENERATOR
SCROLL MODE
SYSTEM MODE COMMAND
COMMAND DECODE
SYSTEM RESET
MASTER LOCK
H TIMING GENERATOR
PHASE DETECT
FRAME DETECT
BUSY
CS
SI
SCK
LCLR
OSC O
OSC I
PD UP
XP DN
CV901
PLL
D901
VCO
LPF
6.5Vp-p
10.6MHz
IC902 ⑪
1.1Vp-p
IC942 ㊸
4.8Vp-p
IC942 ㊹
CG BK
CG IN
CG MW
CHRACTER MIX
YR,YG,YB SYNTHESIS
EDGE SYNTHESIS
TITLE Y READ
Y MATRIX
Y BLK
CR,CG,CB SYNTHESIS
C BLK
TITLE C PEAD
VD
HD
A/D EVR
Q902,903
CLAMP
Q901
LPF
W802
CN802
CN502
Q551(1/2),Q552
Q551(1/2),Q553
COSMO CS
COSMO SO
COSMO SCK
COSMO SI
SERVO/SYSTEM CONTROL (CO-2P)
AUTO FOCUS
LOW CONTRAST
A/D EVR
VIDEO(1)
DDS B
DDS W
A/D Y
CHRACTER
TR
TG
TB
C BLK
CAMERA

3-6. VIDEO BLOCK DIAGRAM(1)


PJ-20 BOARD
(See Page 151)
CV-9 BOARD(VIDEO 1)
(See Page 114)
IC101
JOG CHROMA PROCESS
Q102 JOG SWITCH
JOG (CN202 ⑦)
TH/DL
AMP
SEQUENCE DET
FREQUENCY CONVERTER
MAIN SW
C OUT
PHASE SHIFT
-90° SHIFT
X2
LPF
APC DET
SW 1/2FH
BFXCH
QUASI BURST
1/2 FH
RV103 DELAY BURST PHASE
1/2
AFC ID
HALF H KILLER
COMP. SYNC
Q101 LPF SWITCH
DOC PULSE (CN202 ⑤)
D101
MODE
BF GENERATOR
CN202
PB C IN
W202
Q254 CHROMA BUFFER
C. SYNC (IC203 ⑳)
FL101 4.43MHz BPF
Q103 BUFFER
CNR
Q104,105 MIX AMP
Q108-110 LIMITER AMP
Q106,107 INVERT AMP
RV104 FEEDBACK CHROMA
DL101 2H DELAY
PB C OUT
DOC PULSE
JOG
FH
1/2FH
DOC PULSE (CN502 ⑰)
JOG (CN501 ⑰)
FH (Q242)
RV102 QUASI BURST PHASE
PHASE SHIFT
FSC (IC203 ⑯)
IC203 (1/4)
IC203 53 PB
IC203 53 REC
IC203 31 REC
IC203 20 REC/PB
IC203 35 REC
IC203 35 PB
IC203 39 PB
IC203 39 REC
IC203 25 REC
IC203 59 REC
IC203 22 PB
IC203 60 PB
IC203 57 PB
IC203 56 PB
0.5Vp-p
0.4Vp-p
2.4V p-p
0.35Vp-p
0.42Vp-p
0.2Vp-p
0.24Vp-p
0.7Vp-p
0.34Vp-p
0.55Vp-p
H: 0.1μsec/div
V: 50mV/div
V: 20mV/div
REC Y/PB Y
Q217 BUFFER
L211, C276 CHROMA TRAP
SHARPNESS
EQ
Q401, 403, 405 REC Y AMP PB Y PEAKING
RV401 EMPHASIS INPUT LEVEL
V1 PB MODE (CN502 ①)
AGC AMP
TRAP
CHROMA CANCEL
LPF 1
LPF 2
LPF 3
HPF
ATT
LIM
4.43MHz TRAP
4.43MHz BPF
DOC LPF
Y-YD
C-CD
YD
REC/PB C
SYNC SEP
HALF H KILLER
HD
RV202 Y/C SEP
IR 1
RV203 IR2
IR 2
NOR
DOC
CLAMP
AGC DET
REC Y+C
PB Y
DOC PULSE
IC202
4 FSC PLL
CCD CLOCK
FSC (IC203 ⑯)
V CROSSTALK CANCEL
1H DELAY
DOC PULSE (CN502 ⑰)
JOG (CN501 ⑰)
REC/EE 5V (Q229)
D215
Q254
Q410 SUB TRACT
CN502
DOC PULSE
REC Y RF
PB RF
REC C RF
VIDEO (2) (CO-2P)
PB YC OUT
REC C
Q230,231 REC EQ
RV207 REC Y
Q232 BBUFFER
L221,222 C312,313 CHROMA/AFM BAND REJECTION
Q229
VIDEO 5V
REC/EE 5V
VA PB MODE (CN502 ①)
LIMITER
FM MOD
V/I CONV
RV205 CARR SET
RV204 DEV
CLIP
MAIN PRE-EMPHASIS
SUB EMPHASIS
REC/PB Y
L214,215, C300,301 AFM/ATF TRAP
Q228 BUFFER
L217,C304 CHROMA TRAP
Q224,D211 SOFT LIMITER
Q225 LPF
Q226 CHARACTER SWITCH
Q227 CHARACTER SWITCH
JOG (CN501 ⑰)
Q222,223
PB 5V
VIDEO MUTE (CN501 ⑲)
Q206,207
Q212
Q250 DELAY
Q251 LPF
PB C RF
Q213,241,242 QUASI HD GENERATOR
FN (W202 ⑧)
QUASI HD (IC201 ⑤)
BPF
FM DEMOD
RV402 PB Y LEVEL
Q409 EQ
Q406-408 HALF H SHIFT CANCEL
RF SWP (CN502 ②)
MAIN DE-EMPHASIS
NOISE CANCEL
HPL
Y/C MIX
PB Y+C
RV403 PB VIDEO OUT LEVEL
Q216 PB VIDEO BUFFER
REC/EE 5V (Q229)
Q233 REC C BUFFER
RV208 REC C

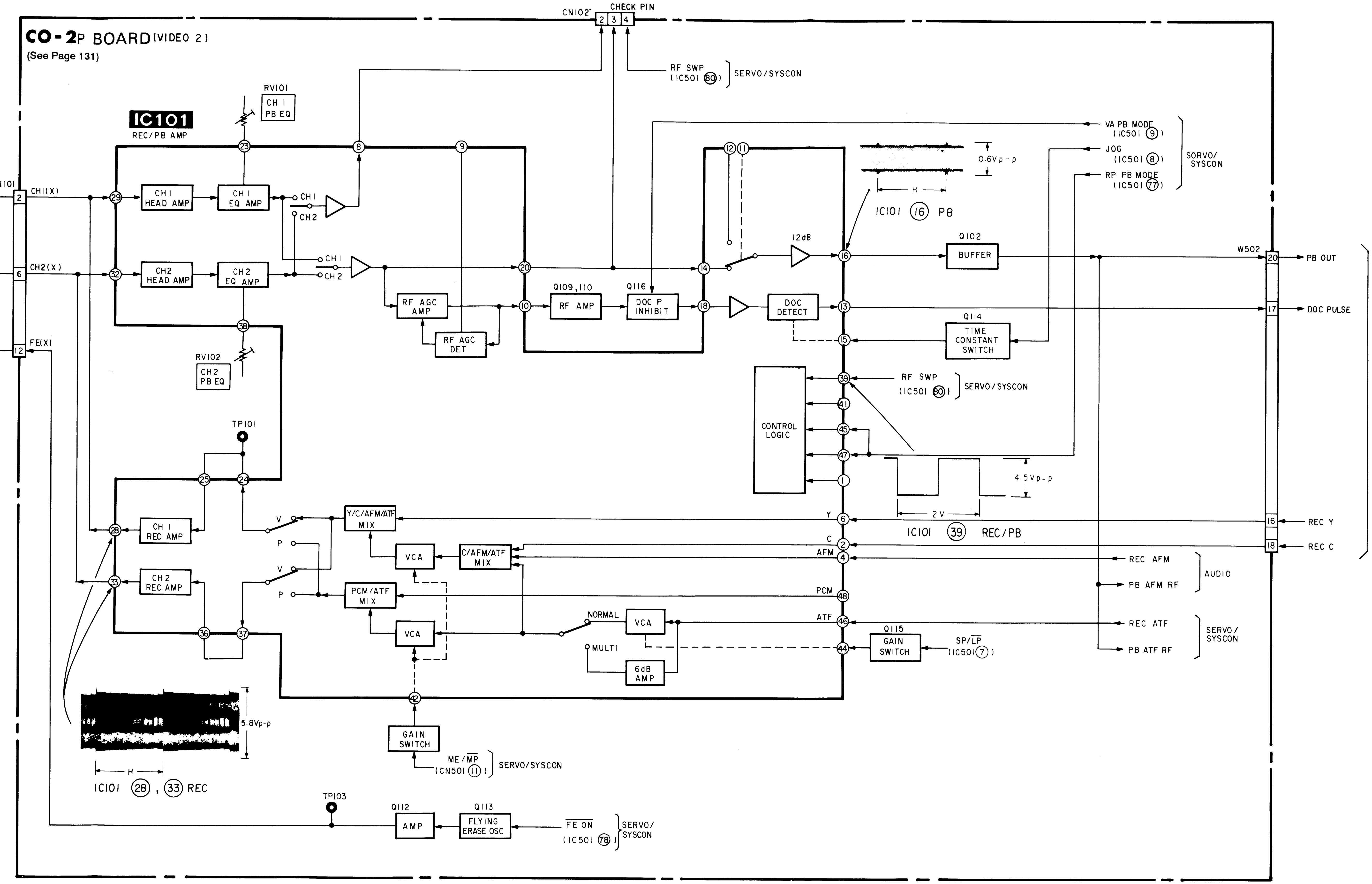

IC202
IC201
IC203 (1/4)
IC502
IC501
4 FSC PLL
CCD CLOCK
CCD COMB FILTER
LPF 1
LPF 2
LPF 3
DOC LPF
CLAMP
V.CROSSTALK CANCEL
1H DELAY
CHROMA CANCEL
TH
Y-YD
C-CD
YD
FSC (IC203 ⑯)
IC203 ㉟ PB
IC203 ㊺, ㊼ REC
IC203 ㊼ PB
IC203 ㊾ REC
IC203 ㊺ PB
IC202 ⑪ REC
IC202 ⑪ PB
IC203 ㊴ REC
0.42Vp-p
0.5Vp-p
0.48Vp-p
0.37Vp-p
0.54Vp-p
0.4Vp-p
0.24Vp-p
REC Y+C
PB Y+C
PB Y
PB C
REC/PB
4.43MHz BPF
LPF
Q209 VIDEO BUFFER
IC201 ⑪ REC/PB, ㉕ REC
IC201 ② PB
IC201 ④ REC
IC201 ⑧ PB
0.5 Vp-p
0.7Vp-p
0.45Vp-p
1Vp-p
2Vp-p
REC/EE/Y+C PB Y+C
3dB AMP
AGC AMP
AGC DET
CLAMP
SYNC SEP
SYNC OUT
CHARACTOR MIX
6dB AMP
VD INSERT
6dB
4.2V REG
RV201
SYNC AGC
Q244 AGC DISCHARGE
V MUTE (CN501 ⑲)
VOB
VOW
JVDO
D213
QUASI HD (Q241)
BUS DECODER
CS CK SI SO SCK
PB IN
IN2
IN1
IN3
LINE Y+C
CAMERA YC
Q211 DIS-CHARGE
VIDEO MUTE (CN501 ⑲)
CAMERA OUT (Q619)
CAMERA
L227, 324 CHROMA TRAP
Q202 EVF CHARACTER MIX
Q208
AF DISP (IC801 ㊱)
VOW3
Australian, E MODEL ONLY
J202 (1/2) VIDEO IN
CN901
VIDEO OUT
EVF (VF-14P/VF-22P)
J201 (1/2) VIDEO OUT
Q203, 204 CURRENT LIMITER
VIDEO 5V
RF DC OUT
RFU DC OUT
CN501
CN502
VIDEO CS
COSMO SCK
COSMO SO
SYSCON (CO-2P)
COMP SYNC (SERVO)
RF SWP
RF SWP (SERVO)
SERVO/SYSCON (CO-2P)
JOG VD (SERVO)
PDUP
XPDN
V CON
XVCO
CV 502
D501
VCO
Q210
POWER SUPPLY FOR IC202, 203
VP SAVE (CN501 ⑭)
JOG VD
SYNC
JOG
JOG (CN501 ⑰)
HD
SYNC GEN
PHASE COMP
ESYI
C SYNC
S DET
MUTE
V MUTE (CN501 ⑲)
SYNC DET
CN802
VD
MASK
VOB1
VOW1
STUP
VOB2
VOW2
VOW3
BLK
VDD
ON
OFF
CHARACTER GENERATOR
STB
CLK
DATA
V
H
HOLD
MP
V BLK
VG
OSCO
OSC1
CV501 CHARACTER POSITION
CG STB
DDS SCK
DDS SO
DIGITAL TITLE (LI-10)
CG BUSY
Q501, 502
DS ON
DATA SCREEN
DDS W
DDS B
Q243 FSC BUFFER
FSC (IC202 ㉕) (W202 ⑩)
1/2 FH
N.C
VCO OUT
APC ADJ
FL203 5.17MHz CF
5.17MHz
FREQ CONV
732KHz
1/375
1/8
375 fH VCO
AFC ID
AFC DET
fH
APC ID DET
4.43MHz
4.43MHz VXO/XO
X201 4.43MHz
APC DET
BID FF
ACK DET
BURST ID DET
SYNC DET
PHASE INVERT
PHASE SHIFT
FL201 PBC TRAP
PB FREQ CONV
PB C 732KHz
ACC DET
ACC AMP
PB C (4.43MHz)
REC/PB C
REC/PB C (4.43MHz)
REC C
BURST FLAG GEN
ACK SW
BURST DE-EMPHASIS
CHROMA EMPHASIS (REC) or DE-EMPHASIS (PB)
BURST EMPHASIS
REC C EQ & AFM TRAP
REC FREQ CONV
4.43MHz (REC C)
FL202 C EMPHASIS TRAP
TRAP FREQ SW
Q215
VA PB MODE (CN502 ①)
BUS DECORDER
D217
D216
RF SWP (CN502 ②)
4.5Vp-p
2V
IC203 ⑭ REC/PB
IC203 ③ PB
0.18Vp-p
4.43MHz
REC 0.25Vp-p
PB 0.3Vp-p
IC203 ⑬ REC/PB
5.17MHz
0.2Vp-p
IC203 ① REC/PB
RV403 PB VIDEO OUT LEVEL
Q216 PB VIDEO BUFFER
Y/C MIX
ATT
PB YI
REC/PB Y
IC203 ㊻ PB
0.55Vp-p
IC203 ④ PB
IC203 ⑤ REC
0.4Vp-p
0.5Vp-p
SP/LP
VP SAVE
V MUTE
VIDEO MUTE
VA PB MODE

3-7. VIDEO BLOCK DIAGRAM(2)


CO-2P BOARD (VIDEO 2)
(See Page 131)
CN102
CHECK PIN
2 3 4
RF SWP (IC501 ⑳) SERVO/SYSCON
RV101 CH1 PB EQ
IC101 REC/PB AMP
DRUM
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
CN101
CH1(X)
CH2(X)
FE(X)
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
CH1
CH2
RF AGC AMP
RF AGC DET
Q109,110
RF AMP
Q116
DOC P INHIBIT
12dB
DOC DETECT
IC101
H
RV102 CH2 PB EQ
TP101
CONTROL LOGIC
RF S
(IC50
CH1 REC AMP
CH2 REC AMP
V
P
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
VCA
PCM/ATF MIX
Y
C
AFM
PCM
ATF
NORMAL
MULTI
6dB AMP
Q115
GAIN SWITCH
5.8Vp-p
IC101 ㉘, ㉝ REC
GAIN SWITCH
ME/MP (CN501 ⑪) SERVO/SYSCON
TP103
Q112
AMP
Q113
FLYING ERASE OSC
FE ON (IC501 ⑱) SERVO/SYSCON

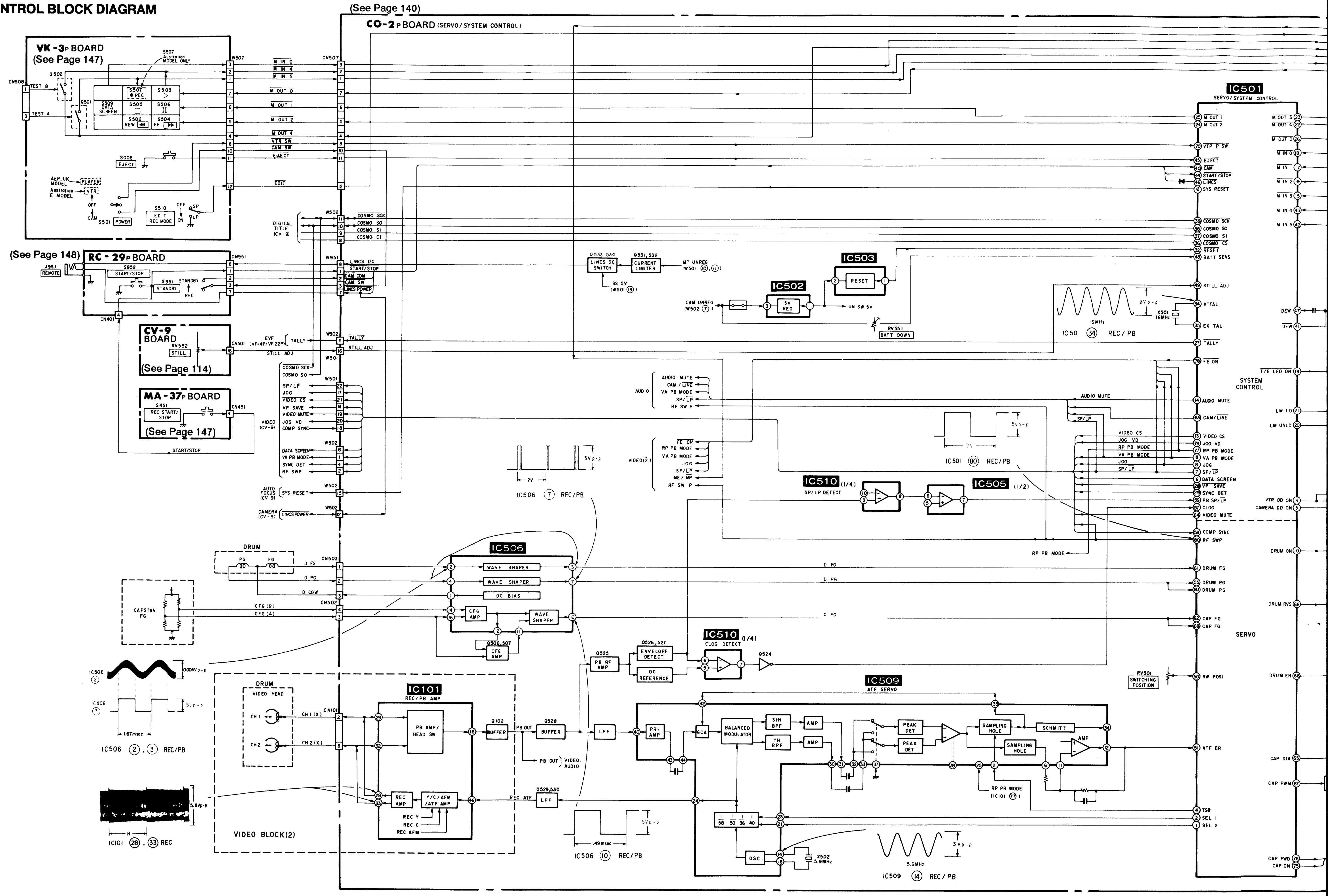
CO-2P BOARD (VIDEO 2)

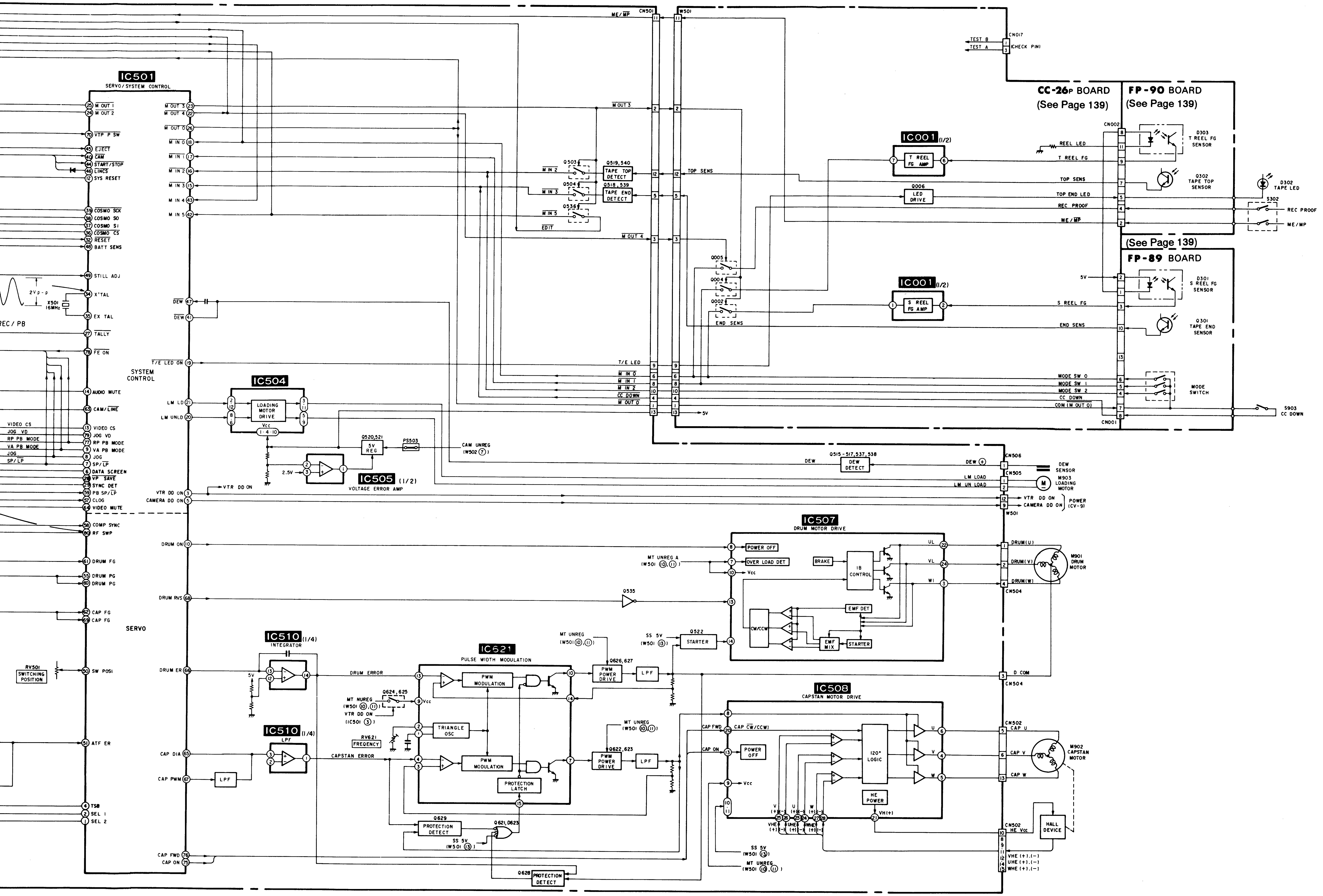
(See Page 131)



CN102
CHECK PIN
2 3 4
RF SWP (IC501 80)
SERVO/SYSCON
RV101
CH 1 PB EQ
IC101
REC/PB AMP
23
8
9
CH1(X)
2
29
CH 1 HEAD AMP
CH 1 EQ AMP
CH 1
CH 2
CH2(X)
6
32
CH2 HEAD AMP
CH2 EQ AMP
CH 1
CH 2
20
RF AGC AMP
RF AGC DET
10
Q109,110
RF AMP
Q116
DOC P INHIBIT
18
DOC DETECT
38
RV102
CH2 PB EQ
FE(X)
12
12
11
14
12dB
16
13
15
VA PB MODE (IC501 9)
JOG (IC501 8)
RP PB MODE (IC501 77)
SORVO/SYSCON
0.6Vp-p
H
IC101 16 PB
Q102
BUFFER
W502
20
PB OUT
17
DOC PULSE
Q114
TIME CONSTANT SWITCH
CONTROL LOGIC
39
41
45
47
1
RF SWP (IC501 80)
SERVO/SYSCON
4.5Vp-p
2V
IC101 39 REC/PB
VIDEO(1) (CV-9)
TP101
25
24
28
CH 1 REC AMP
33
CH 2 REC AMP
36
37
V
P
V
P
Y/C/AFM/ATF MIX
VCA
C/AFM/ATF MIX
PCM/ATF MIX
VCA
Y
6
C
2
AFM
4
PCM
48
ATF
46
44
16
REC Y
18
REC C
REC AFM
PB AFM RF
AUDIO
REC ATF
PB ATF RF
SERVO/SYSCON
NORMAL
MULTI
VCA
6dB AMP
Q115
GAIN SWITCH
SP/LP (IC501 7)
42
GAIN SWITCH
ME/MP (CN501 11)
SERVO/SYSCON
5.8Vp-p
H
IC101 28, 33 REC
TP103
Q112
AMP
Q113
FLYING ERASE OSC
FE ON (IC501 78)
SERVO/SYSCON

3-8. SERVO, SYSTEM CONTROL BLOCK DIAGRAM


(See Page 140)
CO-2P BOARD (SERVO/SYSTEM CONTROL)
VK-3P BOARD
(See Page 147)
S507 Australian MODEL ONLY
Q502
Q501
CN508
TEST B
TEST A
S507 ●REC
S503 ▷
S509 DATA SCREEN
S505 □
S506 ||
S502 REW ◀◀
S504 FF ▶▶
S008 EJECT
AEP, UK MODEL
PLAYER
Australian E MODEL
VTR
OFF
CAM
S501 POWER
S510 EDIT REC MODE
OFF
ON
SP
LP
W507
CN507
M IN 0
M IN 4
M IN 5
M OUT 0
M OUT 1
M OUT 2
M OUT 4
VTR SW
CAM SW
EJECT
EDIT
DIGITAL TITLE (CV-9)
W502
COSMO SCK
COSMO SO
COSMO SI
COSMO CI
(See Page 148)
RC-29P BOARD
CN951
J951 REMOTE
S952 START/STOP
S951 STANDBY
STANDBY
REC
W951
LINCS DC
START/STOP
CAM COM
CAM SW
LINCS POWER
CN401
CV-9 BOARD
RV552 STILL
(See Page 114)
CN501
EVF (VF14P/VF-22P)
TALLY
STILL ADJ
W501
MA-37P BOARD
S451 REC START/STOP
CN451
(See Page 147)
START/STOP
COSMO SCK
COSMO SO
SP/LP
JOG
VIDEO CS
VP SAVE
VIDEO MUTE
JOG VD
COMP SYNC
VIDEO (CV-9)
DATA SCREEN
VA PB MODE
SYNC DET
RF SWP
AUTO FOCUS (CV-9)
SYS RESET
CAMERA (CV-9)
LINCS POWER
Q533, 534 LINCS DC SWITCH
Q531, 532 CURRENT LIMITER
MT UNREG (W501 ⑩, ⑪)
SS 5V (W501 ⑬)
IC503 RESET
IC502 5V REG
CAM UNREG (W502 ⑦)
UN SW 5V
RV551 BATT DOWN
2Vp-p
X501 16MHz
IC501 ㉞ REC/PB
AUDIO
AUDIO MUTE
CAM/LINE
VA PB MODE
SP/LP
RF SW P
VIDEO (2)
FE ON
RP PB MODE
VA PB MODE
JOG
SP/LP
ME/MP
RF SW P
5Vp-p
2V
IC501 ㊿ REC/PB
IC510 (1/4) SP/LP DETECT
IC505 (1/2)
IC506 ⑦ REC/PB
RP PB MODE
DRUM
PG
FG
D FG
D PG
D COM
CN503
CN502
CAPSTAN FG
CFG (B)
CFG (A)
IC506
WAVE SHAPER
DC BIAS
CFG AMP
Q506, 507 CFG AMP
C FG
Q525 PB RF AMP
Q526, 527 ENVELOPE DETECT
DC REFERENCE
IC510 (1/4) CLOG DETECT
Q524
IC506 ② 0.004Vp-p
IC506 ③ 5Vp-p
1.67msec
IC506 ②, ③ REC/PB
DRUM VIDEO HEAD
CH1
CH2
CN101
CH1 (X)
CH2 (X)
IC101 REC/PB AMP
PB AMP/HEAD SW
Q102 BUFFER
PB OUT
Q528 BUFFER
PB OUT } VIDEO, AUDIO
REC AMP
Y/C/AFM/ATF AMP
REC Y
REC C
REC AFM
REC ATF
Q529, 530 LPF
LPF
5.8Vp-p
H
IC101 ㉘, ㉝ REC
VIDEO BLOCK (2)
1.49msec
IC506 ⑩ REC/PB
IC509 ATF SERVO
PRE AMP
GCA
BALANCED MODULATOR
3fH BPF
fH BPF
AMP
PEAK DET
SAMPLING HOLD
SCHMITT
RP PB MODE (IC101 ⑦)
OSC
X502 5.9MHz
3Vp-p
5.9MHz
IC509 ⑭ REC/PB
RV501 SWITCHING POSITION
IC501 SERVO/SYSTEM CONTROL
M OUT 1
M OUT 2
VTP P SW
EJECT
CAM
START/STOP
LINCS
SYS RESET
COSMO SCK
COSMO SO
COSMO SI
COSMO CS
RESET
BATT SENS
STILL ADJ
X'TAL
EX TAL
TALLY
FE ON
AUDIO MUTE
CAM/LINE
VIDEO CS
JOG VD
RP PB MODE
VA PB MODE
JOG
SP/LP
DATA SCREEN
VP SAVE
SYNC DET
PB SP/LP
CLOG
VIDEO MUTE
COMP SYNC
RF SWP
DRUM FG
DRUM PG
CAP FG
SW POSI
ATF ER
TSB
SEL 1
SEL 2
M OUT 3
M OUT 4
M OUT 0
M IN 0
M IN 1
M IN 2
M IN 3
M IN 4
M IN 5
DEW
SYSTEM CONTROL
T/E LED ON
LM LD
LM UNLD
VTR DD ON
CAMERA DD ON
SERVO
DRUM ON
DRUM RVS
DRUM ER
CAP DIA
CAP PWM
CAP FWD
CAP ON


IC501
SERVO/SYSTEM CONTROL
SYSTEM CONTROL
SERVO
IC504
LOADING MOTOR DRIVE
IC505 (1/2)
VOLTAGE ERROR AMP
IC507
DRUM MOTOR DRIVE
IC508
CAPSTAN MOTOR DRIVE
IC510 (1/4)
INTEGRATOR
IC510 (1/4)
LPF
IC621
PULSE WIDTH MODULATION
IC001 (1/2)
T REEL FG AMP
IC001 (1/2)
S REEL FG AMP
CC-26P BOARD
(See Page 139)
FP-90 BOARD
(See Page 139)
(See Page 139)
FP-89 BOARD
CN501
W501
CN017
(CHECK PIN)
TEST B
TEST A
D303
T REEL FG SENSOR
Q302
TAPE TOP SENSOR
D302
TAPE LED
S302
REC PROOF
ME/MP
D301
S REEL FG SENSOR
Q301
TAPE END SENSOR
MODE SWITCH
S903
CC DOWN
Q006
LED DRIVE
Q519,540
TAPE TOP DETECT
Q518,539
TAPE END DETECT
Q505
Q504
Q536
Q005
Q004
Q002
END SENS
TOP SENS
Q520,521
5V REG
PS503
CAM UNREG (W502 ⑦)
Q515-517,537,538
DEW DETECT
DEW SENSOR
M903
LOADING MOTOR
VTR DD ON
CAMERA DD ON
POWER (CV-9)
M901
DRUM MOTOR
M902
CAPSTAN MOTOR
HALL DEVICE
Q535
Q522
STARTER
Q626,627
PWM POWER DRIVE
Q622,623
PWM POWER DRIVE
LPF
PWM MODULATION
TRIANGLE OSC
PROTECTION LATCH
Q624,625
RV621
FREQENCY
Q629
PROTECTION DETECT
Q621,Q623
Q628
PROTECTION DETECT
RV501
SWITCHING POSITION
X501 16MHz
2Vp-p
POWER OFF
OVER LOAD DET
BRAKE
18 CONTROL
EMF DET
CW/CCW
EMF MIX
120° LOGIC
HE POWER
DRUM ERROR
CAPSTAN ERROR
MT UNREG
SS 5V
CN502
CN504
CN505
CN506
REC/PB

3-9. SYSTEM CONTROL SECTION FUNCTION DESCRIPTION

The system control section consists of the following four microcomputers:

- Mode/mechanism control microcomputer CXP80116
- DDS microcomputer µPD7508BGB
- EVR microcomputer MC68HC05N4FU
- AF microcomputer MC68HC05C4FU

3-9-1. Mode/Mechanism Control Microcomputer CXP80116 (IC501 on CO-2P Board)

1. Function description

1) Power ON/OFF control
2) Key matrix read
   (Playback, record, fast-forward, rewind, pause, stop, data screen)
   * REC key is only provided with E, Australian model .
3) Reading of other keys
   (Power (camera/off/video), cassette eject)
4) Servos
5) Loading motor control
6) Error detection
   - Battery end/pre-end
   - Tape end
   - No cassette
   - Erasure prevention
   - DEW (condensation)
   - PAUSE release
   - CLOG (jamming)
   - L. motor emergency
   - Drum rotation
   - Drum phase
   - Reel rotation
   - Capstan rotation
   - Drum/capstan start
6) H.M.S. counter
7) JOG VD insertion
8) Execution of various modes

2. Abbreviated specifications

- 8-bit high-speed, highly integrated single chip microcomputer
- A/D converter, 8-bit, 8-channel
- Serial interface
- Time/counter
- Time base timer
- Vector interrupts
- High precision timing pattern generation function (high-speed output)
- PWM/DA gate pulse output, 12-bit, 2-channel
- High precision measurement function (FRC) for servo signals
- Power on reset function
- Sleep and stop functions
- External memory expansion mode, microcomputer mode
- ROM: 16 kbytes
- RAM: 352 kbytes
- Speed: 500 ns
- Process: C MOS
- Operating voltage: 4.5 to 5.5V
- Package: 80-pin flat package

3-9-2. DDS Microcomputer µPD7508BGB (IC651 on DK-4P Board)

1. Function description

1) Internal data communication control
2) Date/time measurement
3) Reading of key matrix
   (White balance, electronic shutter, edit search +/–, auto-lock, focus mode, counter reset, zero memory, title, store, color/mode, back light compensation, date/forward, time/set)

2. Operation modes

As shown in the table below, the operation mode is determined according to the position of the power switch (camera/off/video) and whether or not there is a main battery.

Mode	Main Battery	Power Switch	Microcomputer Power	Clock Mode	Main Functions
BACK UP	No	Camera/off/ video	Lithium battery	500 ms intermittent oscillation	• Backup of title and tape counter data • Clock count operation
	Yes	Off			
VTR ON	Yes	Video	SS 5V (main battery)	Continuous oscillation	• Serial communication with EVR and mode/mechanism control micro-computer • Indication to EVF • Acceptance of zero memory and counter reset keys
CAM ON	Yes	Camera	SS 5V (main battery)	Continuous oscillation	• VTR ON functions + all camera features • Indication control for white balance, focus, titles, electronic shutter, etc.

3-9-3. EVR Microcomputer MC68HC05N4FU (IC601 on CV-9 Board)

1. Function description

1) EVR control
2) Auto white balance control
3) Electronic shutter

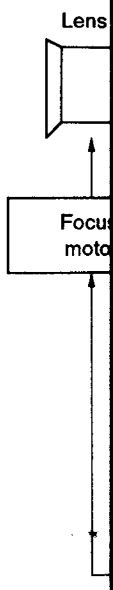
3-9-4. AF

1. Functio
1) AF cont
2) Power f
3) Zoom m

2. Auto fo
(Λ -AF

The high fr
luminance si
using externa

3. Outline
The frequenc
2 MHz are e
digitally inte
the evaluati
information
finding the p
that:
Picture is in
frequency c
increases



ctions

ape counter data
on

on with EVR and
control micro-

ro memory and

s + all camera

or white balance,
ic shutter, etc.

3-9-4. AF Microcomputer MC68HC05C4FU (IC802 on CV-9 Board)

1. Function description

1) AF control
2) Power focus
3) Zoom motor drive

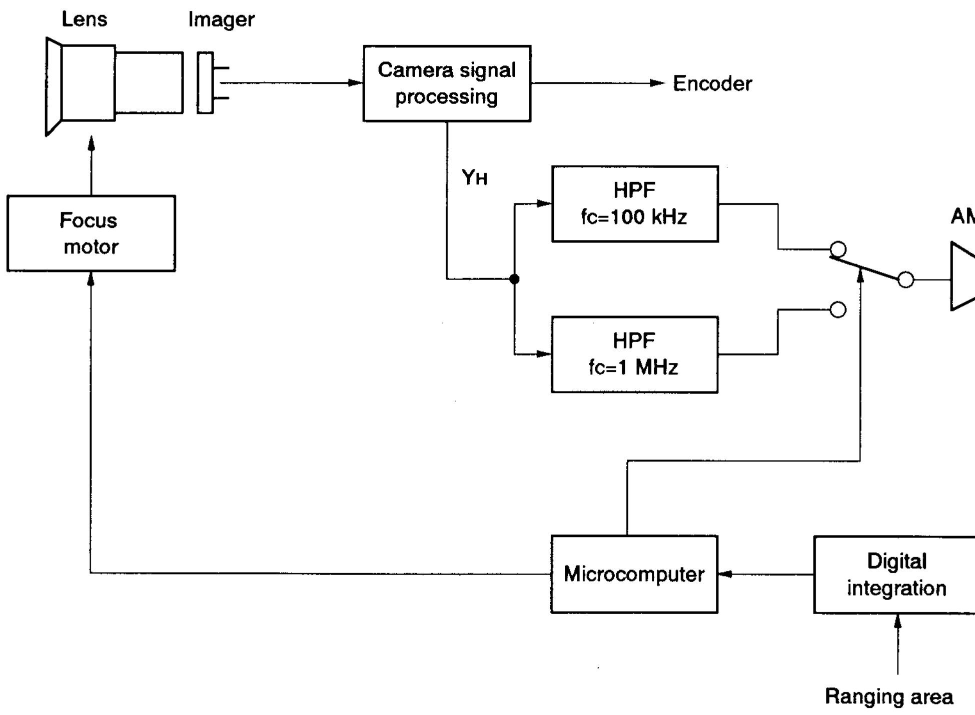
2. Auto focus system of this unit
(Λ -AF: Image processing system)

The high frequency components of the video signal (actually luminance signal)are microcomputer processed by TCL without using external sensors to control the focus.

3. Outline of operation

The frequency components from 100k to 2 MHz and from 1M to 2 MHz are extracted from the luminance signal Y, and these are digitally integrated for each field. This integration value is called the evaluation value. This evaluation value becomes the information for auto focusing, and the focus ring is controlled by finding the peaks in the evaluation values based on the concepts that:

Picture is in focus → edges of image become clearer → high frequency components of image increase → evaluation value increases



3-9-5. Mode/Mechanism Control — Video, Audio Block Interface

Signal	I/O	Pin No.	STOP	FF	REW	CUE	REVIEW	PB	PB・PAUSE	REC	REC・PAUSE
ME/$\overline{\text{MP}}$	O	Pin ⑪ of CN501 on CO-2P board	*1	*1	*1	*1	*1	*1	*1	*1	*1
SP/$\overline{\text{LP}}$	O	Pin ⑦ of IC501 on CO-2P board	*17	*17	*17	*2	*2	*2	*2	*17	*17
JOG	O	Pin ⑧ of IC501 on CO-2P board	L	L	L	H	H	L	H	L	L
VA PB MODE	O	Pin ⑨ of IC501 on CO-2P board	L	L	L	H	H	H	H	L	L
VIDEO CS	O	Pin ⑬ of IC501 on CO-2P board	*3	*3	*3	*3	*3	*3	*3	*3	*3
AUDIO MUTE	O	Pin ⑭ of IC501 on CO-2P board	L	L	L	H	H	L	H	L	L
$\overline{\text{VP SAVE}}$ *16	O	Pin ㉘ of IC501 on CO-2P board	H	H	H	L	L	L	L	L	H
SYNC DET *14	O	Pin ㉙ of IC501 on CO-2P board	*4	*4	*4	*5	*5	*5	*5	*4	*4
COSMO SO	O	Pin ㊳ of IC501 on CO-2P board	*6	*6	*6	*6	*6	*6	*6	*6	*6
$\overline{\text{COSMO SCK}}$	O	Pin ㊴ of IC501 on CO-2P board	*7	*7	*7	*7	*7	*7	*7	*7	*7
CLOG	I	Pin (57) of IC501 on CO-2P board	H	*8	*8	*8	*8	*8	*8	H	H
COMP SYNC	I	Pin (58) of IC501 on CO-2P board	*9	*9	*9	*9	*9	*9	*9	*9	*9
PB SP/$\overline{\text{LP}}$	I	Pin (59) of IC501 on CO-2P board	L	*10	*10	*10	*10	L	L	L	L
CAM/$\overline{\text{LINE}}$	O	Pin (63) of IC501 on CO-2P board	*11	*11	*11	*11	*11	*11	*11	*11	*11
VIDEO MUTE *15	O	Pin (64) of IC501 on CO-2P board	L	L	L	L	L	L	L	L	L
RP PB MODE	O	Pin (77) of IC501 on CO-2P board	L	L	L	H	H	H	H	L	L
$\overline{\text{FE ON}}$	O	Pin (78) of IC501 on CO-2P board	H	H	H	H	H	H	H	L	H
JOG VD	O	Pin (79) of IC501 on CO-2P board	L	L	L	*12	*12	L	*12	L	L
RF SWP	O	Pin (80) of IC501 on CO-2P board	H	*13	*13	*13	*13	*13	*13	*13	*13

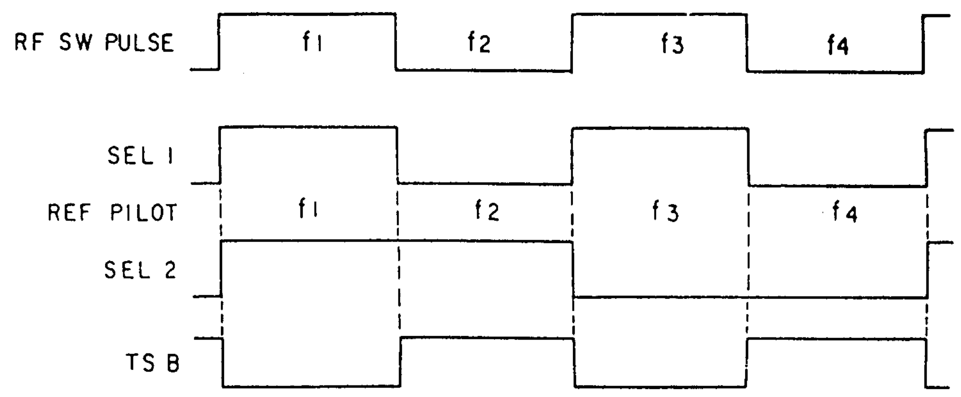
*1. "L" when using MP tape
*2. According to recorded mode of PB tape (SP: "H", LP: "L")
*3. Approx. 20 msec period "L" pulse. Chip select signal to video IC (IC201 and IC203 on CV-9 board)
*4. "H" when video signals are input.
*5. "H" when video signals are played back.
*6. 1V period "L" pulse train
*7. 1V period "L" pulse train
*8. Video head clog: "H", Normally: "L"
*9. Positive polarity composite sync signal
*10. SP mode recorded tape: "H", LP mode recorded tape: "L"
*11. "L" when the power switch is set to VIDEO position and "H" when CAMERA position.
*12. 1V period "H" pulse
*13. 2V period duty 50% pulse
*14. Detects a composite sync signal input at pin (58) of IC501.
*15. "H" when STOP to/from PB mode transition period.
*16. This signal switches a power (on/off) of video circuit IC202 and IC203.
*17. Depends on the SP/LP switch (S510 on the VK-3P board) position (SP: "H", LP: "L")

3-9-6. Mode/Mechanism Control — Servo Peripheral Circuit Interface

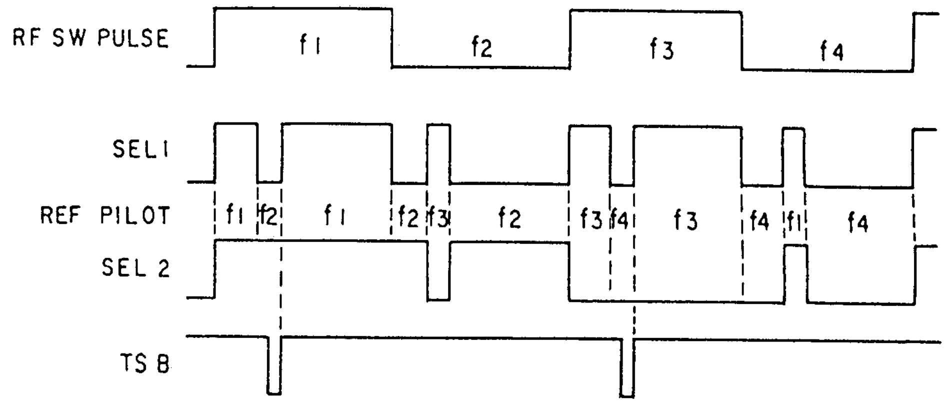
Signal	I/O	Pin No.	EJECTED	THREAD-ING	UN THREAD-ING	STOP	FF	REW	CUE	REVIEW	PB	PB・PAUSE	REC	REC・PAUSE
SEL 2 *17	O	Pin ① of IC501 on CO-2P board	L	L	L	L	H	H	*3	*3	*2	H	*1	H
SEL 1 *17	O	Pin ② of IC501 on CO-2P board	H	H	H	H	H	H	*3	*3	*2	L	*1	H
TS B *18	O	Pin ④ of IC501 on CO-2P board	L	L	L	L	L	L	*3	*3	*2	*16	*1	L
DRUM ON	O	Pin ⑩ of IC501 on CO-2P board	L	H	H	L	H	H	H	H	H	H	H	H
SW POSI ADJ	I	Pin ㊿ of IC501 on CO-2P board	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
ATF ERROR	I	Pin (51) of IC501 on CO-2P board	*6	*6	*6	*6	*7	*7	*7	*7	*7	*7	*6	*6
DRUM PG	I	Pins (55) and (60) of IC501 on CO-2P board	L	*8	*8	L	*8	*8	*8	*8	*8	*8	*8	*8
DRUM FG	I	Pin (61) of IC501 on CO-2P board	H	*9	*9	H	*9	*9	*9	*9	*9	*9	*9	*9
CAP FG	I	Pins (62) and (69) of IC501 on CO-2P board	H/L	PULSE	PULSE	H/L	*10	*10	*10	*10	*10	H/L	*10	H/L
CAP D/A	I	Pin (65) of IC501 on CO-2P board	L	*11	*11	L	*11	*11	*11	*11	*11	L	*11	L
DRUM D/A	O	Pin (66) of IC501 on CO-2P board	L	*12	*12	L	*12	*12	*12	*12	*12	*12	*12	*12
CAP PWM	O	Pin (67) of IC501 on CO-2P board	L	*13	*13	L	*13	*13	*13	*13	*13	L	*13	L
DRUM FWD/REV	O	Pin (68) of IC501 on CO-2P board	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14
CAP ON	O	Pin (75) of IC501 on CO-2P board	L	H	H	L	H	H	H	H	H	L	H	L
CAP FWD/$\overline{\text{RVS}}$	O	Pin (76) of IC501 on CO-2P board	L	L	H	L	H	L	H	L	H	L	H	L
RF SWP	O	Pin (80) of IC501 on CO-2P board	H	*15	*15	H	*15	*15	*15	*15	*15	*15	*15	*15

*1. See timing chart 1.
*2. See timing chart 2.
*3. See timing chart 3.
*4. 1V period "H" pulse
*5. DC voltage set with RV501 (Switching position adjustment)
*6. Approx. 2.3 Vdc constant
*7. ATF error voltage
*8. 2V period "H" pulse
*9. 1.7 msec period pulse
*10. Pulses of frequecy in proportion to tape speed
*11. "H" pulse output when rising or falling edges of the capstan, Normaly: "HIZ"
*12. 6 msec period PWM signal (tri-state) of "H", "L" and "HIZ" (2.5 Vdc)
*13. 64 µsec period PWM signal
*14. Normally: "H"
*15. 2V period duty 50% pulse
*16. V period "L" pulse
*17. ATF REF PILOT signal frequency (f1 to f4) selecting signal
*18. ATF AGC timing control signal

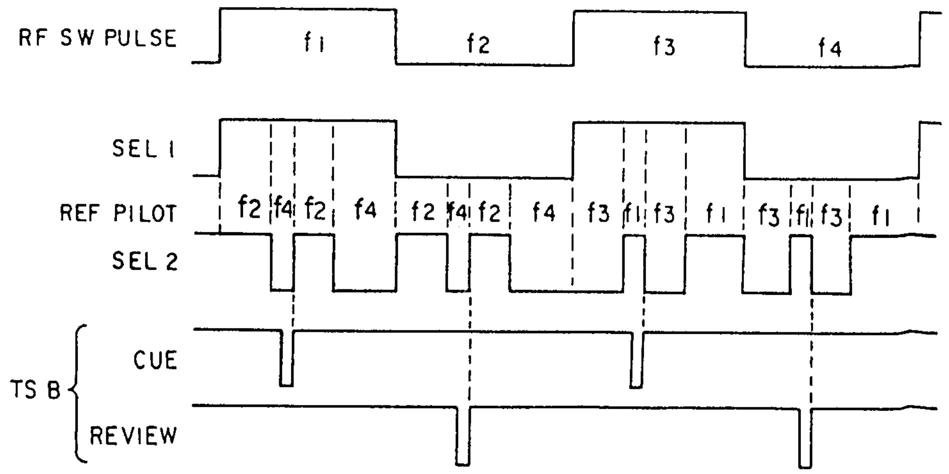
Timing chart 1 (REC)


RF SW PULSE
f1
f2
f3
f4
SEL 1
REF PILOT
f1
f2
f3
f4
SEL 2
TS B

Timinfg chart 2 (PB)


RF SW PULSE
f1
f2
f3
f4
SEL1
REF PILOT
f1
f2
f1
f2
f3
f2
f3
f4
f3
f4
f1
f4
SEL 2
TS B

Timing chart 3 (CUE/REVIEW)


RF SW PULSE
f1
f2
f3
f4
SEL I
REF PILOT
f2
f4
f2
f4
f2
f4
f2
f4
f3
f1
f3
f1
f3
f1
f3
f1
SEL 2
TS B
CUE
REVIEW

3-9-7. Mode/Mechanism Control — Mode/Mechanism Control Peripheral Circuit Interface

Signal	I/O	Pin No.	I/O Level
VTR DD ON	O	Pin ③ of IC501 on CO-2P board	VTR DC/DC converter on/off signal "H" when power of video or camera is turned on.
CAM DD ON	O	Pin ⑤ of IC501 on CO-2P board	Camera DC/DC converter on/off signal "H" when power of camera is turned on.
DATA SCREEN	O	Pin ⑥ of IC501 on CO-2P board	"H" when data screen is turned on.
SP/$\overline{\text{LP}}$	O	Pin ⑦ of IC501 on CO-2P board	"H" during SP recording mode or playback of tape recorded in SP mode
$\overline{\text{SYS RESET}}$	O	Pin ⑫ of IC501 on CO-2P board	Reset signal of AF microcomputer (IC802 on the CV-9 board) Normally: "H" ("L" pulse when power of video or camera is turned on.)
$\overline{\text{M IN 3}}$	I	Pin ⑮ of IC501 on CO-2P board	No key matrix input signal: "H" (Other: "L")
$\overline{\text{M IN 2}}$	I	Pin ⑯ of IC501 on CO-2P board	No key matrix input signal: "H" (Other: "L")
$\overline{\text{M IN 1}}$	I	Pin ⑰ of IC501 on CO-2P board	No key matrix input signal: "H" (Other: "L")
$\overline{\text{M IN 0}}$	I	Pin ⑱ of IC501 on CO-2P board	No key matrix input signal: "H" (Other: "L")
T/E LED	O	Pin ⑲ of IC501 on CO-2P board	Tape top/end LED lighting control signal STOP/PB/REC/PB·PAUSE/REC·PAUSE/REVIEW: 170 msec period "H" pulse, CUE: 22 msec period "H" pulse, FF/REW: 4 msec period "H" pulse, EJECT or CASSETTE IN detecting: 22 msec period "H" pulse
LM UNLD	O	Pin ⑳ of IC501 on CO-2P board	Normally: "L" ("H" in Unthreading, "H" pulse is output in Mechanical mode transition)
LM LD	O	Pin ㉑ of IC501 on CO-2P board	Normally: "L" ("H" in Threading, "H" pulse is output in Mechanical mode transition)
M OUT 4	O	Pin ㉒ of IC501 on CO-2P board	Key matrix output signal 20 msec period "H" pulse
M OUT 3	O	Pin ㉓ of IC501 on CO-2P board	Key matrix output signal 20 msec period "H" pulse
$\overline{\text{M OUT 2}}$	O	Pin ㉔ of IC501 on CO-2P board	Key matrix output signal 20 msec period "L" pulse
$\overline{\text{M OUT 1}}$	O	Pin ㉕ of IC501 on CO-2P board	Key matrix output signal 20 msec period "L" pulse
$\overline{\text{M OUT 0}}$	O	Pin ㉖ of IC501 on CO-2P board	Key matrix output signal 20 msec period "L" pulse
$\overline{\text{TALLY}}$	O	Pin ㉗ of IC501 on CO-2P board	TALLY LED control signal. Normally: "H" ("L" during REC mode when power switch is set to CAMERA position)
$\overline{\text{RESET}}$	I	Pin ㉜ of IC501 on CO-2P board	Normally: "H" (Reset: "L")
$\overline{\text{COSMO CS}}$	I	Pin ㊱ of IC501 on CO-2P board	1V period "L" pulse (18 msec period in VTR mode)
COSMO SI	I	Pin ㊲ of IC501 on CO-2P board	1V period "H" pulse train (18 msec period in VTR mode)
COSMO SO	O	Pin ㊳ of IC501 on CO-2P board	1V period "L" pulse train (18 msec period in VTR mode)
$\overline{\text{COSMO SCK}}$	I/O	Pin ㊴ of IC501 on CO-2P board	1V period "L" pulse train (18 msec period in VTR mode)
$\overline{\text{CAM P SW}}$	I	Pin ㊵ of IC501 on CO-2P board	"L" when power switch (S501 on the VK-3P board) is set to CAMERA position and standby switch (S951 on the RC-29P board) to STANDBY position.
$\overline{\text{M IN 5}}$	I	Pin ㊷ of IC501 on CO-2P board	No key matrix input signal: "H" (Other: "L")
$\overline{\text{M IN 4}}$	I	Pin ㊸ of IC501 on CO-2P board	No key matrix input signal: "H" (Other: "L")
$\overline{\text{START/STOP}}$	O	Pin ㊹ of IC501 on CO-2P board	Normally: "H" ("L" when start/stop button (S952 on the RC-29P board or S451 on the MA-37P board) is pressed.)
$\overline{\text{EJECT}}$	I	Pin ㊺ of IC501 on CO-2P board	Normally: "H" ("L" when EJECT switch (S508 on VK-3P board) is pressed.)
$\overline{\text{LINCS}}$	I	Pin ㊻ of IC501 on CO-2P board	Normally: "H" ("L" pulse when power button of the remote controller is turned on.)
$\overline{\text{DEW}}$	I	Pin ㊼ of IC501 on CO-2P board	Normally: "H" ("L" when dew)
BATT DOWN	I	Pin ㊽ of IC501 on CO-2P board	Main battery voltage (CAM UNREG) is divided by RV551 (battery down adjustment) and input. For detecting battery end/pre-end.
STILL ADJ	I	Pin ㊾ of IC501 on CO-2P board	DC voltage set by RV552 (STILL adjustment) on the CV-9 board is input.
CLOG	I	Pin (57) of IC501 on CO-2P board	Normal playback: "L" ("H" when PB RF signal is not reproduced due to head clog, etc..
PB SP/$\overline{\text{LP}}$	I	Pin (59) of IC501 on CO-2P board	Recording speed mode detection signal in FF, REW, CUE or REVIEW mode ("H" in SP mode, "L" in LP mode)
$\overline{\text{VTR P SW}}$	I	Pin (70) of IC501 on CO-2P board	"Normally: "H" ("L" when power switch (S501 on the VK-3P board) is set to video position.)

3-9-8. Mode/Mechanism Control — Mechanism Block Interface

<table>
<tr><th>Signal</th><th>I/O</th><th>Pin No.</th><th>I/O Level</th></tr>
<tr><td>S REEL FG</td><td>I</td><td>Pin ③ of CN001 on CC-26P board</td><td>Pulse (Approx. 4 Vp-p) that is generated by S-reel rotation.
It is approx. 1 sec period in REC/PB (SP) mode.</td></tr>
<tr><td>MODE SW 2</td><td>I</td><td>Pin ④ of CN001 on CC-26P board</td><td rowspan="4">Pins are connected to mode switch for mechanical position detection.
<table>
<tr><th></th><th>EJECTED</th><th>THREADING UNTHREADING</th><th>STOP</th><th>REC/PB/FF/ REW/CUE/ REVIEW/PAUSE</th></tr>
<tr><td>MODE SW 2 (④−⑦)</td><td>○</td><td>○</td><td>×</td><td>○</td></tr>
<tr><td>MODE SW 1 (⑤−⑦)</td><td>×</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>MODE SW 0 (⑥−⑦)</td><td>×</td><td>×</td><td>○</td><td>○</td></tr>
</table>
×……Open
○……Short</td></tr>
<tr><td>MODE SW 1</td><td>I</td><td>Pin ⑤ of CN001 on CC-26P board</td></tr>
<tr><td>MODE SW 0</td><td>I</td><td>Pin ⑥ of CN001 on CC-26P board</td></tr>
<tr><td>$\overline{\text{M OUT 0}}$ (COM)</td><td>O</td><td>Pin ⑦ of CN001 on CC-26P board</td></tr>
<tr><td>CC DOWN</td><td>I</td><td>Pin ⑧ of CN001 on CC-26P board</td><td rowspan="2">It is connected to cassette compartment down detection (CC DOWN) switch.
When cassette compartment comes down, connection between Pins ⑧ and ⑦ are short-circuited.
When cassette compartment comes up, connection between Pins ⑧ and ⑦ is open.</td></tr>
<tr><td>$\overline{\text{MOUT 0}}$ (COM)</td><td>O</td><td>Pin ⑦ of CN001 on CC-26P board</td></tr>
<tr><td>END SENS</td><td>I</td><td>Pin ⑩ of CN001 on CC-26P board</td><td>Normally: “L” (“H” pulse is output in tape end or cassette unloaded)</td></tr>
<tr><td>13/10</td><td>I</td><td>Pin ⑪ of CN001 on CC-26P board</td><td>Not used</td></tr>
<tr><td>TOP END LED</td><td>O</td><td>Pin ⑤ of CN002 on CC-26P board</td><td>“L” pulse (approx. 1 Vp-p)
(pulse period is changed from 12 to 170 msec according to operation mode.)</td></tr>
<tr><td>TOP SENS</td><td>I</td><td>Pin ⑦ of CN002 on CC-26P board</td><td>Normally: “L” (“H” pulse is output in tape top or cassette unloaded)</td></tr>
<tr><td>ME/$\overline{\text{MP}}$</td><td>I</td><td>Pin ② of CN002 on CC-26P board</td><td>“L” in MP tape (“H” pulse (20 msec period) in cassette unloaded)</td></tr>
<tr><td>REC PROOF</td><td>I</td><td>Pin ④ of CN002 on CC-26P board</td><td>“L” when recording possible cassette is loaded.
“H” pulse (20 msec period) is output, when recording inhibiting cassette is loaded.</td></tr>
<tr><td>T REEL FG</td><td>I</td><td>Pin ⑨ of CN002 on CC-26P board</td><td>Pulse (Approx. 4 Vp-p) that is generated by T-reel rotation, in REC/PB (SP) mode, it is approx. 1 sec period.</td></tr>
</table>

3-9-9. DDS Microcomputer (IC651 on CK-8P Board) — Peripheral Circuit Interface

PIN No.	Signal Name	I/O	Function and I/O Level
1	CMI 0	I	Key matrix input signal. Normally "H". When key input, "L" pulse for 18 ms (VTR mode) or 1V period (camera mode).
2	CMI 1	I	
3	CMI 2	I	
4	CMI 3	I	
5	$\overline{\text{CMO 0}}$	O	Key matrix output signal. "L" pulse for 18 ms (VTR mode) or 1V period (camera mode).
6	$\overline{\text{CMO 1}}$	O	
7	$\overline{\text{CMO 2}}$	O	
8	$\overline{\text{CMO 3}}$	O	
15	RESET	I	Normally "L".
16	CL 1	I	System clock oscillation pin. • Video power ON or camera power ON Continuous oscillation (oscillation frequency approx. 320 kHz) • Power OFF or backed up by lithium battery 500 ms intermittent oscillation (oscillation frequency approx. 70 kHz)
18	CL 2	O	
19	INT 1	I	Interrupt input by camera VD. VTR mode: "H" Camera mode: 1V period "H" pulse
21	$\overline{\text{DDS SCK}}$	I/O	Serial communication·serial clock I/O. V period "L" pulse train.
22	DDS SO	O	Serial communication·data output. V period "H" pulse train.
24	DDS SI	I	Serial communication·data input. V period "L" pulse train.
25	CG BUSY	I	Busy signal input from character generator. V period "H" pulse train.
26	VTR PWR	I	SS 5V power detection. "H" while power ON.
27	LI PE	I	Lithium battery pre-end detection. Normally "H". "L" when lithium battery voltage drops.
28	$\overline{\text{TEST}}$	I	Test mode input. Normally "H".
29	CG STB	O	Strobe signal for character generator. 1V period "H" pulse train.
30	$\overline{\text{COSMO CS}}$	O	Chip select signal to servo/system control microcomputer (IC501 on CO-2P board). 1V period "L" pulse.
31	$\overline{\text{EVR CS}}$	O	Chip select signal to EVR microcomputer (IC601 on CV-9 board). 1V period "L" pulse.
32	CMO 4	O	Key matrix output signal. "H" pulse for 18 ms (VTR mode) or 1V period (camera mode).
34	TITLE CS	O	Chip select signal to title controller (IC902 on LI-10 board). VTR mode: "L" Camera mode: 1V period "H" pulse.
35	SRAM CS	O	Chip select signal to static RAM (IC903 on LI-10 board). VTR mode: "L" Camera mode: Normally "L". "H" during title operation.
36	TG STB	O	Strobe signal to timing generator (CV-9 board, DT-79 board). Camera mode: 1V period "H" pulse. VTR mode: "L"
38	X1		Crystal oscillation circuit for clock. Oscillation frequency of 32.768 kHz.
39	X2		

3-9-10. EVR Microcomputer (IC601 on CV-9 Board) — Peripheral Circuit Interface

PIN No.	Signal Name	I/O	Function and I/O Level
1	–		–
2	DA SSW	O	"H" only during communication with serial switching D/A converter. V period "H" pulse.
3	$\overline{\text{EVR SCLK}}$	O	Serial clock output. V period "L" pulse train.
4	EVR SI	I	Serial data input. V period "H" pulse train.
5	EVR SO	O	Serial data output. V period "L" pulse train.
6	$\overline{\text{EVR CS}}$	I	Communication request from DDS. V period "L" pulse.
7	L IN	I	LINCS input. L: 0, H: 1. V period "H" pulse train.
8	L OUT	O	LINCS output. L: 0, H: 1. V period "H" pulse train.
9	$\overline{\text{CAM ADJ}}$	I	Normal/Adjust selection. Normally "H". "L" during adjustment.
10	NC	–	NC
11	DDS SSW	O	DDS serial selection. V period "L" pulse.
12, 13	LD	O	Data load instruction to EVR (IC608, IC609). V period "H" pulse.
14	BL	–	"L" for back light compensation ON.
15	IN/OUT	I	Indoors/outdoors mode discrimination input. "H": indoors, "L": outdoors.
16	–		
17	Vpp		EEPROM write voltage supply: connected to GND.
18			GND
19	–	–	
20	PAL/$\overline{\text{NTSC}}$	I	Broadcast system selection. L: NTSC, H: PAL.
21	GND		–
22	GND		–
23	GND		–
24, 25	GND		–
26	GND	–	–
27	GND	–	–
28	CAM 5V	I	Camera power on monitoring. L: CAM OFF, H: CAM ON.
29	AW IN	I	AWB A/D timer stop. Pattern drive interrupt. Normally 2V period pulse.
30	AW ADJ	O	AWB preset data fetch. Normally "L". "H" during auto white balance adjustment.
31	–	–	NC
32	DPCS	–	–
33	–	–	–
34	S3SW	O	AWB measurement signal selection. 3V period "H" pulse.
35	S2SW	O	AWB measurement signal selection. 3V period "H" pulse.
36	DISCHG	O	Capacitor reset pulse for timer measurement lamp voltage generation. V period "H" pulse.
37	–	–	–
38	S1SW	O	AWB measurement signal selection. 3V period "H" pulse.
39	–	–	–
40	OSC2	O	Built-in inverter output for oscillation. Oscillation frequency: 4 MHz.
41	OSC1	I	Built-in inverter input for oscillation.
42	VDD		Connected to EVER 5V.
43	–		–
44	$\overline{\text{RESET}}$		Normally "H". "L" when reset.
45	$\overline{\text{IRQ}}$		Connected to $\overline{\text{EVR CS}}$ signal. V period "L" pulse.
46	–	–	EVER 5V
47	–	–	EVER 5V
48	$\overline{\text{A/D EN}}$	O	1-bit A/D converter operation ON/OFF output for titler. Normally "H". "L" for 7V period when title store button (S657 on CK-19P board) pressed.

3-9-11. AF Microcomputer (IC802 on CV-9 Board) — Peripheral Circuit Interface

PIN No.	Signal Name	I/O	Function and I/O Level
1	$\overline{\text{SS}}$ OUT	O	EVR data read timing output (PD5 SS input). V period "L" pulse train.
2	IRIS IN/$\overline{\text{OUT}}$	O	Indoors/outdoors determination according to aperture value. "H" for indoors and "L" for outdoors.
3			
4			
5			
6	$\overline{\text{LOW CONTRAST}}$	O	Signal to DDS microcomputer (IC651 on CK-19P board). "L" when subject has low contrast.
7	–	–	
8			Not used.
9	–	–	
10	–	–	
11	$\overline{\text{ZOOM T}}$	O	Normally "H". "L" when zoom motor is rotated in telephoto direction by remote control.
12	$\overline{\text{ZOOM W}}$	O	Normally "H". "L" when zoom motor is rotated in wide angle direction by remote control.
13	Focus N	O	Normally "L". "H" when focus motor is rotated in close range direction.
14	–	–	
15	Focus ∞	O	Normally "L". "H" when focus motor is rotated in far range direction.
16	F SPD ϕ	O	Bit 0 (LSB) of focus motor speed control signal.
17	–	–	
18	F SPD1	O	Bit 1 of focus motor speed control signal.
19	F SPD2	O	Bit 2 of focus motor speed control signal.
20	–	–	
21	F SPD3	O	Bit 3 (MSB) of focus motor speed control signal.
22	–	–	
23	Vss	–	Connected to GND.
24	Vss	–	Connected to GND.
25	–	–	
26	$\overline{\text{Focus N}}$	I	"L" when focus ring is at close range edge.
27	–	–	
28	–	–	
29	–	–	
30	$\overline{\text{FOCUS }\infty}$	O	"L" when focus ring is at far range edge.
31	AF SSW	O	Timing output for bus selection. V period "H" pulse.
32	–	–	
33	DA STB	O	For AF D/A converter data latch. V period "H" pulse train.
34	PAL/$\overline{\text{NTSC}}$	I	NTSC/PAL selection.
35	–	–	
36	$\overline{\text{J STB}}$	O	For external display jig data latch. V period "L" pulse.
37	XCS	O	Active "L" for communication request to IC801 CXD-1204. V period "L" pulse.
38	TEST	–	Connected to VDD.
39	–	–	
40	MODE		Connected to VDD.
41	MISO	I/O	SPI Master: in, Slave: out. V period "H" pulse train.
42	MOSI	I/O	SPI Master: out, Slave: in. V period "L" pulse train.
43	$\overline{\text{SCK}}$	I/O	SPI serial clock. V period "L" pulse train.
44	–	–	
45	$\overline{\text{SS}}$	I	V period "L" pulse train.
46	–	–	

PIN No.	Sig
48	$\overline{\text{EVR CS}}$
49	–
50	–
51	$\overline{\text{Focus F}}$
52	CLK OU
53	–
54	CLK IN
55	VDD
56	–
57	–
58	–
59	–
60	$\overline{\text{SYS RS}}$
61	AREA
62	Vpp
63	WND W
64	–

"H" pulse.

t.

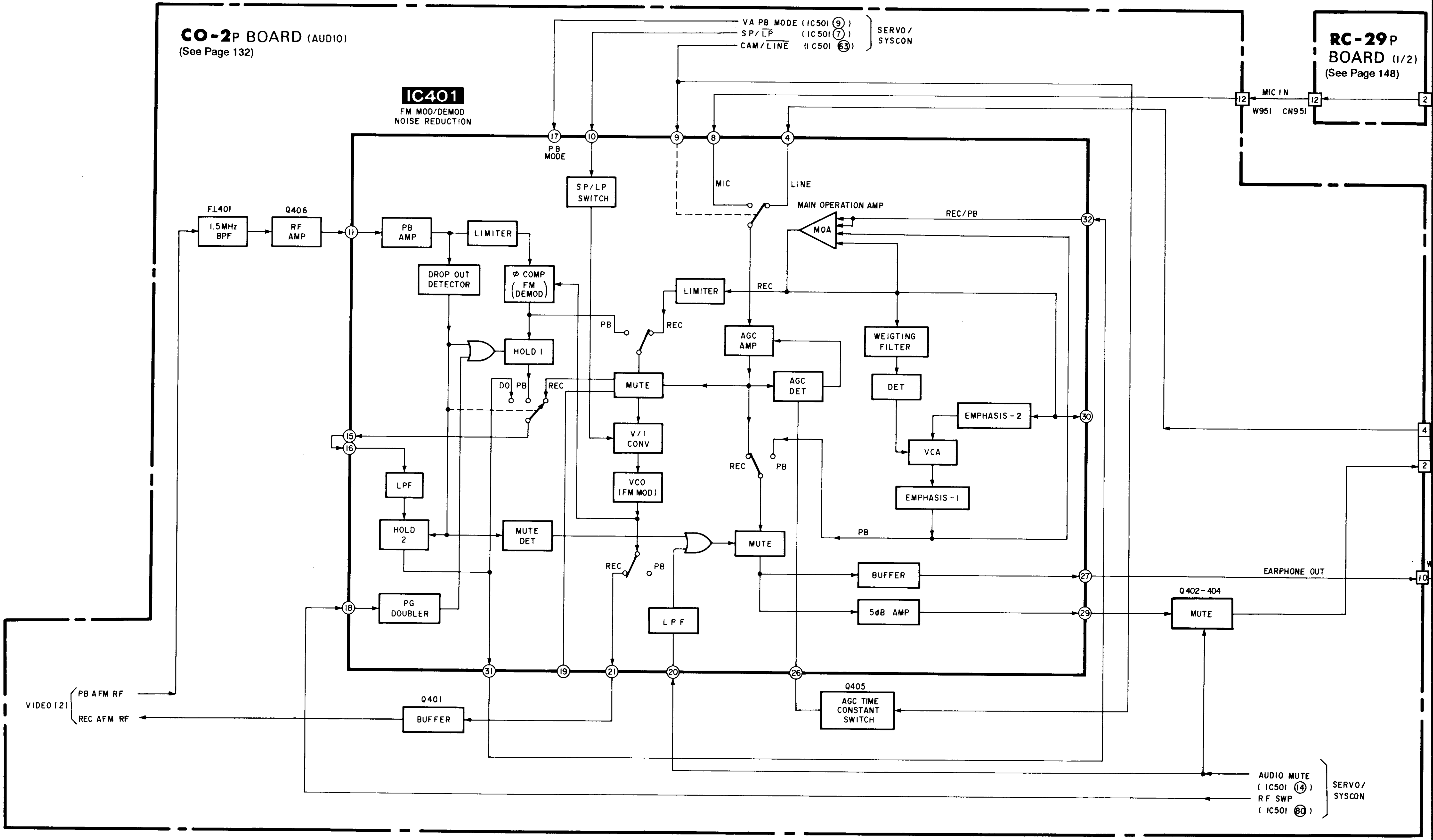
"H" pulse.

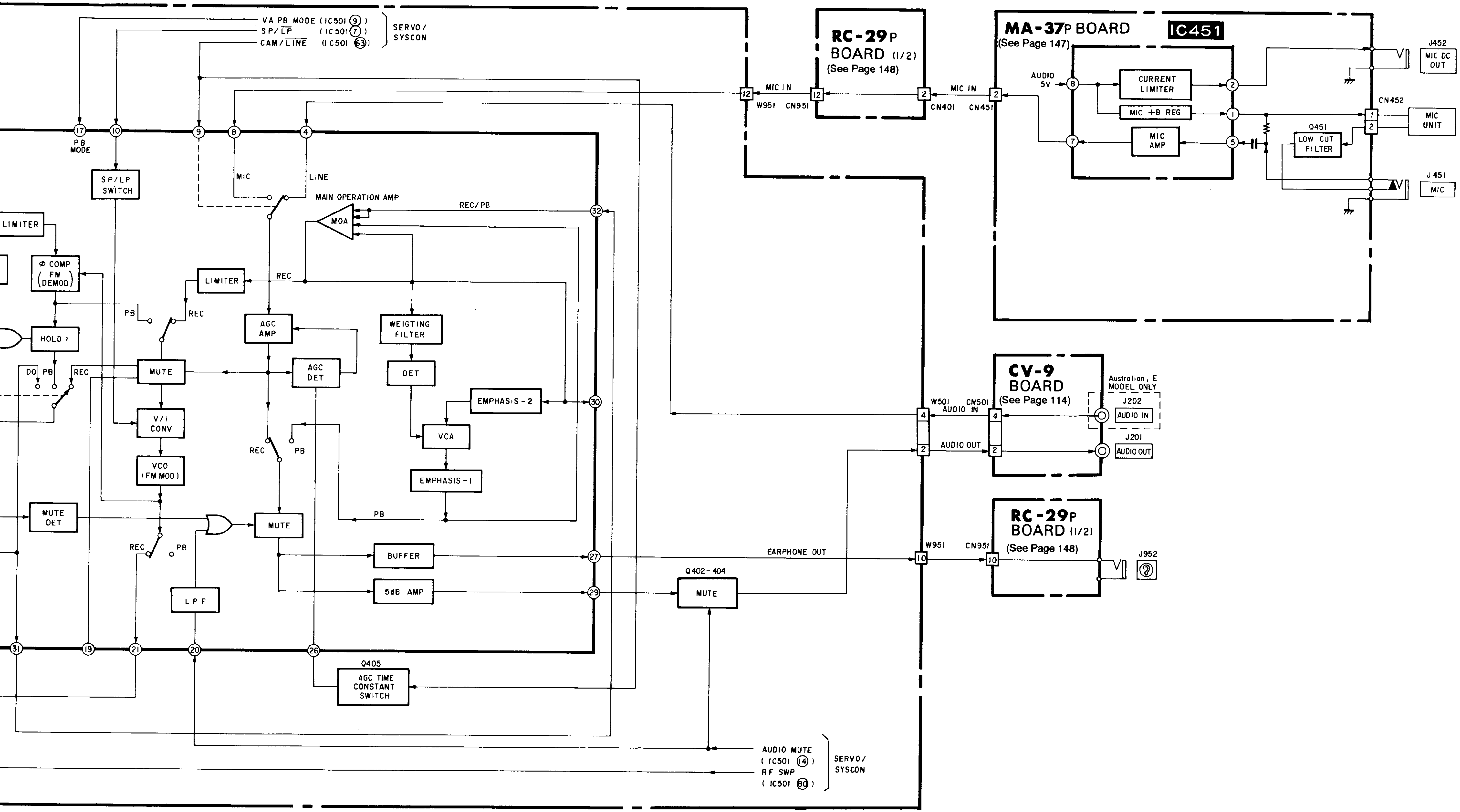
3-9-11. AF Microcomputer (IC802 on CV-9 Board) — Peripheral Circuit Interface

PIN No.	Signal Name	I/O	Function and I/O Level
1	$\overline{\text{SS}}$ OUT	O	EVR data read timing output (PD5 SS input). V period "L" pulse train.
2	IRIS IN/$\overline{\text{OUT}}$	O	Indoors/outdoors determination according to aperture value. "H" for indoors and "L" for outdoors.
3			
4			
5			
6	$\overline{\text{LOW CONTRAST}}$	O	Signal to DDS microcomputer (IC651 on CK-19P board). "L" when subject has low contrast.
7	–	–	
8			Not used.
9	–	–	
10	–	–	
11	$\overline{\text{ZOOM T}}$	O	Normally "H". "L" when zoom motor is rotated in telephoto direction by remote control.
12	$\overline{\text{ZOOM W}}$	O	Normally "H". "L" when zoom motor is rotated in wide angle direction by remote control.
13	Focus N	O	Normally "L". "H" when focus motor is rotated in close range direction.
14	–	–	
15	Focus ∞	O	Normally "L". "H" when focus motor is rotated in far range direction.
16	F SPD ϕ	O	Bit 0 (LSB) of focus motor speed control signal.
17	–	–	
18	F SPD1	O	Bit 1 of focus motor speed control signal.
19	F SPD2	O	Bit 2 of focus motor speed control signal.
20	–	–	
21	F SPD3	O	Bit 3 (MSB) of focus motor speed control signal.
22	–	–	
23	Vss	–	Connected to GND.
24	Vss	–	Connected to GND.
25	–	–	
26	Focus $\overline{\text{N}}$	I	"L" when focus ring is at close range edge.
27	–	–	
28	–	–	
29	–	–	
30	$\overline{\text{FOCUS ∞}}$	O	"L" when focus ring is at far range edge.
31	AF SSW	O	Timing output for bus selection. V period "H" pulse.
32	–	–	
33	DA STB	O	For AF D/A converter data latch. V period "H" pulse train.
34	PAL/$\overline{\text{NTSC}}$	I	NTSC/PAL selection.
35	–	–	
36	$\overline{\text{J STB}}$	O	For external display jig data latch. V period "L" pulse.
37	XCS	O	Active "L" for communication request to IC801 CXD-1204. V period "L" pulse.
38	TEST	–	Connected to V_{DD}.
39	–	–	
40	MODE		Connected to V_{DD}.
41	MISO	I/O	SPI Master: in, Slave: out. V period "H" pulse train.
42	MOSI	I/O	SPI Master: out, Slave: in. V period "L" pulse train.
43	$\overline{\text{SCK}}$	I/O	SPI serial clock. V period "L" pulse train.
44	–	–	
45	$\overline{\text{SS}}$	I	V period "L" pulse train.
46	–	–	

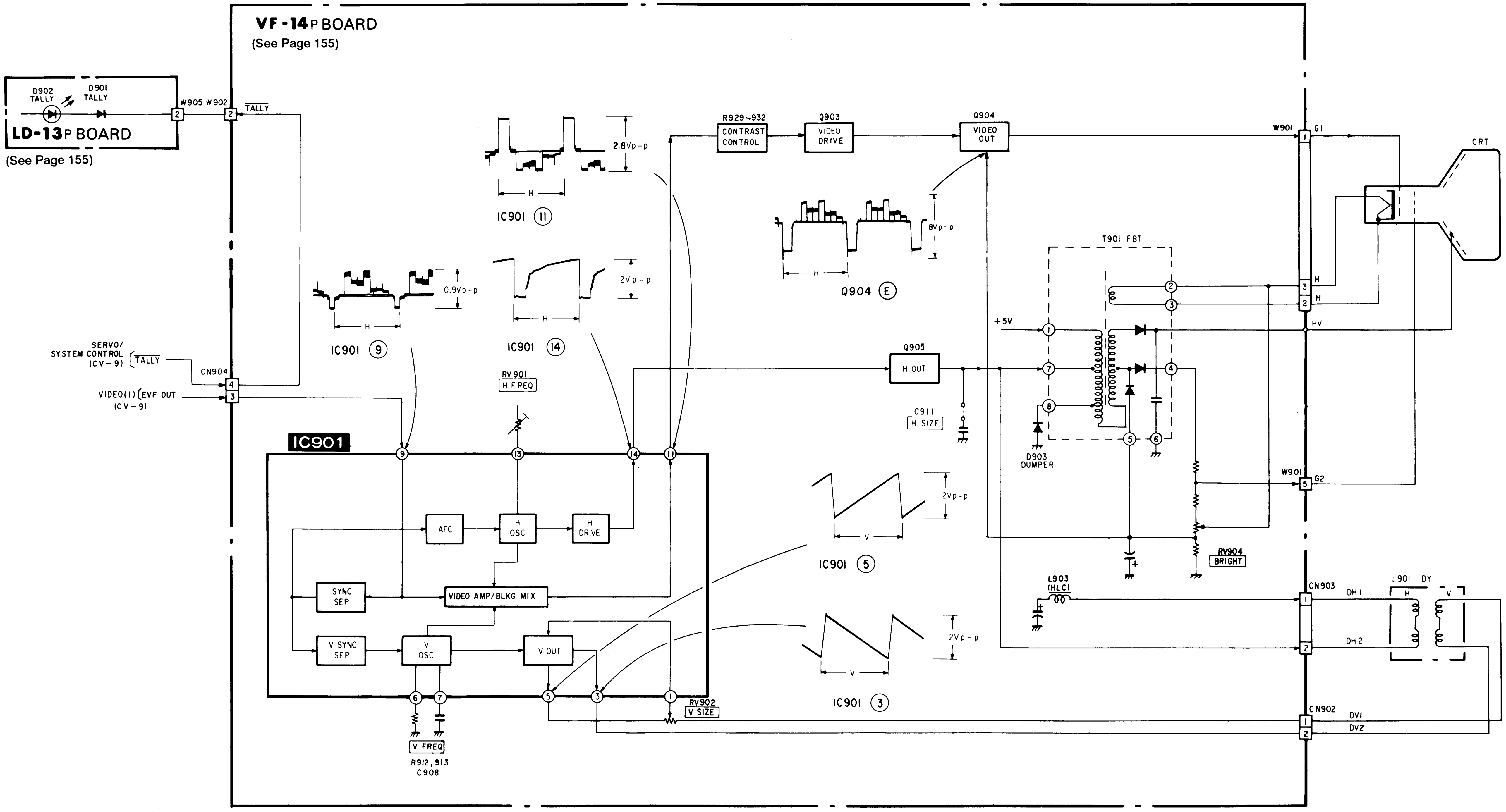
PIN No.	Signal Name	I/O	Function and I/O Level
48	$\overline{\text{EVR CS}}$	I	"L" for EVR data communication request from DDS microcomputer. V period "L" pulse.
49	–	–	
50	–	–	
51	$\overline{\text{Focus FG}}$	I	Interrupt generation at falling edge of focus motor FG. "H" when auto focus OFF. When auto focus ON, "L" pulse with period according to rotational speed of focus motor.
52	CLK OUT	O	Waveform shaped output of Pin (54) clock. (1.79 MHz)
53	–	–	
54	CLK IN	I	External clock input. 14.3 MHz clock input to Pin ㉘ of IC801 is divided to 1/8 and input.
55	V_{DD}		CAM 4.9V
56	–	–	
57	–	–	
58	–	–	
59	–	–	
60	$\overline{\text{SYS RST}}$	I	Normally "H". "L" when reset.
61	AREA	I	Interrupt generation at falling edge from CXD-1204 (IC801). V period pulse.
62	Vpp		CAM 4.9V
63	WND W/$\overline{\text{N}}$	I	Auto focus range area selection. Connected to V_{DD} by 100 kΩ (fixed at wide range side).
64	–	–	

3-10. AUDIO BLOCK DIAGRAM


CO-2P BOARD (AUDIO)
(See Page 132)
IC401
FM MOD/DEMOD
NOISE REDUCTION
VA PB MODE (IC501 ⑨)
SP/LP (IC501 ⑦)
CAM/LINE (IC501 63)
SERVO/
SYSCON
RC-29P
BOARD (1/2)
(See Page 148)
MIC IN
W951
CN951
12
12
2
PB
MODE
17
10
9
8
4
SP/LP
SWITCH
MIC
LINE
MAIN OPERATION AMP
REC/PB
MOA
32
FL401
1.5MHz
BPF
Q406
RF
AMP
11
PB
AMP
LIMITER
DROP OUT
DETECTOR
φ COMP
(FM
DEMOD)
LIMITER
REC
PB
REC
HOLD 1
AGC
AMP
WEIGTING
FILTER
DO
PB
REC
MUTE
AGC
DET
DET
EMPHASIS - 2
30
15
16
V/I
CONV
VCA
REC
PB
4
2
LPF
VCO
(FM MOD)
EMPHASIS - 1
HOLD
2
MUTE
DET
PB
MUTE
REC
PB
BUFFER
27
EARPHONE OUT
10
Q402-404
5dB AMP
29
MUTE
18
PG
DOUBLER
LPF
31
19
21
20
26
Q405
AGC TIME
CONSTANT
SWITCH
VIDEO (2)
PB AFM RF
REC AFM RF
Q401
BUFFER
AUDIO MUTE
(IC501 ⑭)
RF SWP
(IC501 80)
SERVO/
SYSCON

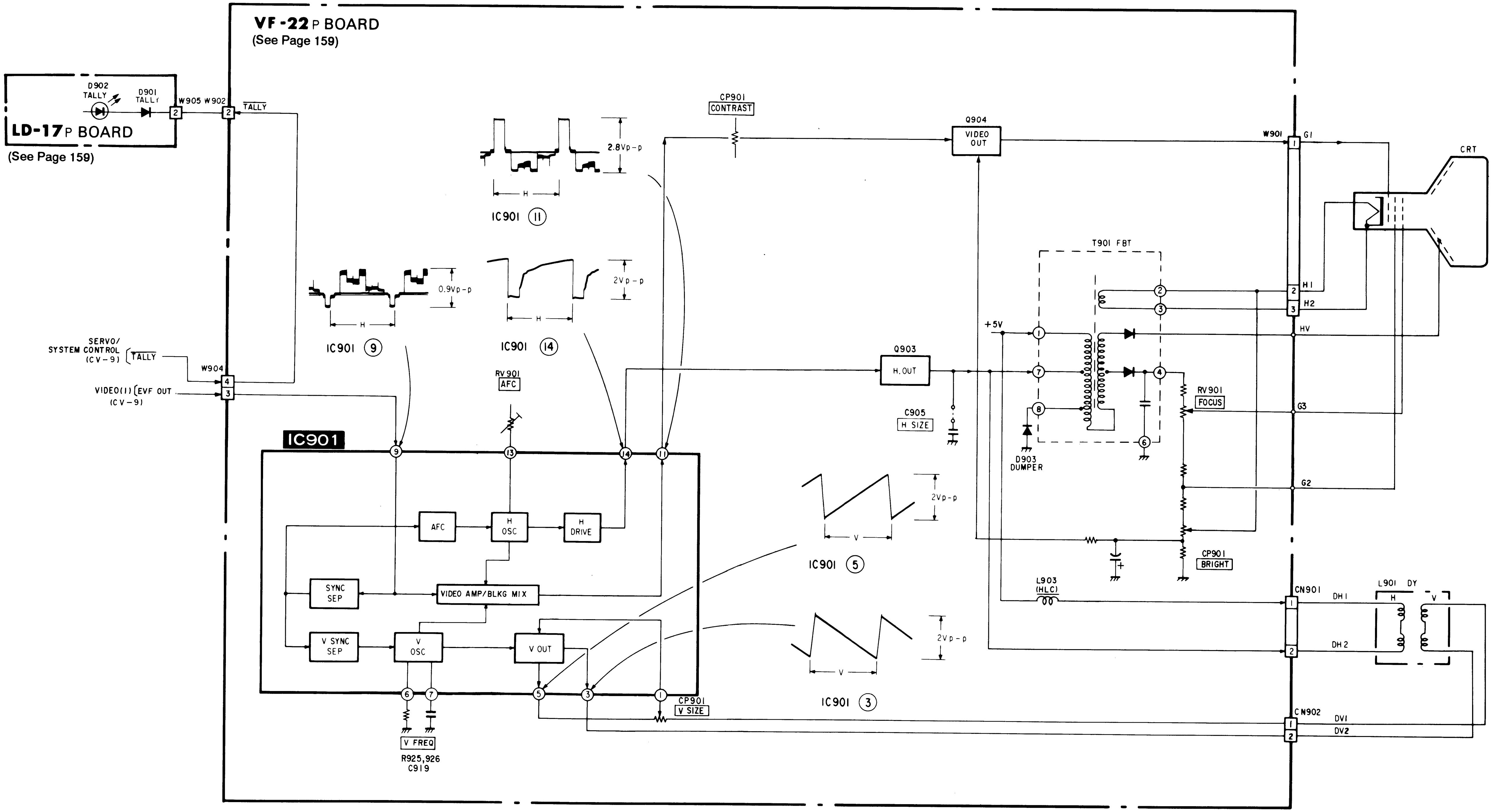

VA PB MODE (IC501 ⑨)
SP/$\overline{LP}$ (IC501 ⑦)
CAM/$\overline{LINE}$ (IC501 ㊳)
SERVO/
SYSCON
PB
MODE
SP/LP
SWITCH
MIC
LINE
MAIN OPERATION AMP
REC/PB
MOA
LIMITER
Φ COMP
(FM
DEMOD)
LIMITER
REC
PB
REC
HOLD I
AGC
AMP
WEIGTING
FILTER
DO
PB
REC
MUTE
AGC
DET
DET
EMPHASIS - 2
V/I
CONV
VCA
REC
PB
VCO
(FM MOD)
EMPHASIS - I
PB
MUTE
DET
MUTE
REC
PB
BUFFER
5dB AMP
LPF
Q402-404
MUTE
EARPHONE OUT
Q405
AGC TIME
CONSTANT
SWITCH
AUDIO MUTE
(IC501 ⑭)
RF SWP
(IC501 ⑳)
SERVO/
SYSCON
MIC IN
W951
CN951
RC-29P
BOARD (1/2)
(See Page 148)
MIC IN
CN401
CN451
MA-37P BOARD
(See Page 147)
IC451
AUDIO
5V
CURRENT
LIMITER
MIC +B REG
MIC
AMP
Q451
LOW CUT
FILTER
J452
MIC DC
OUT
CN452
MIC
UNIT
J451
MIC
CV-9
BOARD
(See Page 114)
W501
CN501
AUDIO IN
AUDIO OUT
Australian, E
MODEL ONLY
J202
AUDIO IN
J201
AUDIO OUT
RC-29P
BOARD (1/2)
(See Page 148)
W951
CN951
J952

3-11. VIEW FINDER BLOCK DIAGRAM

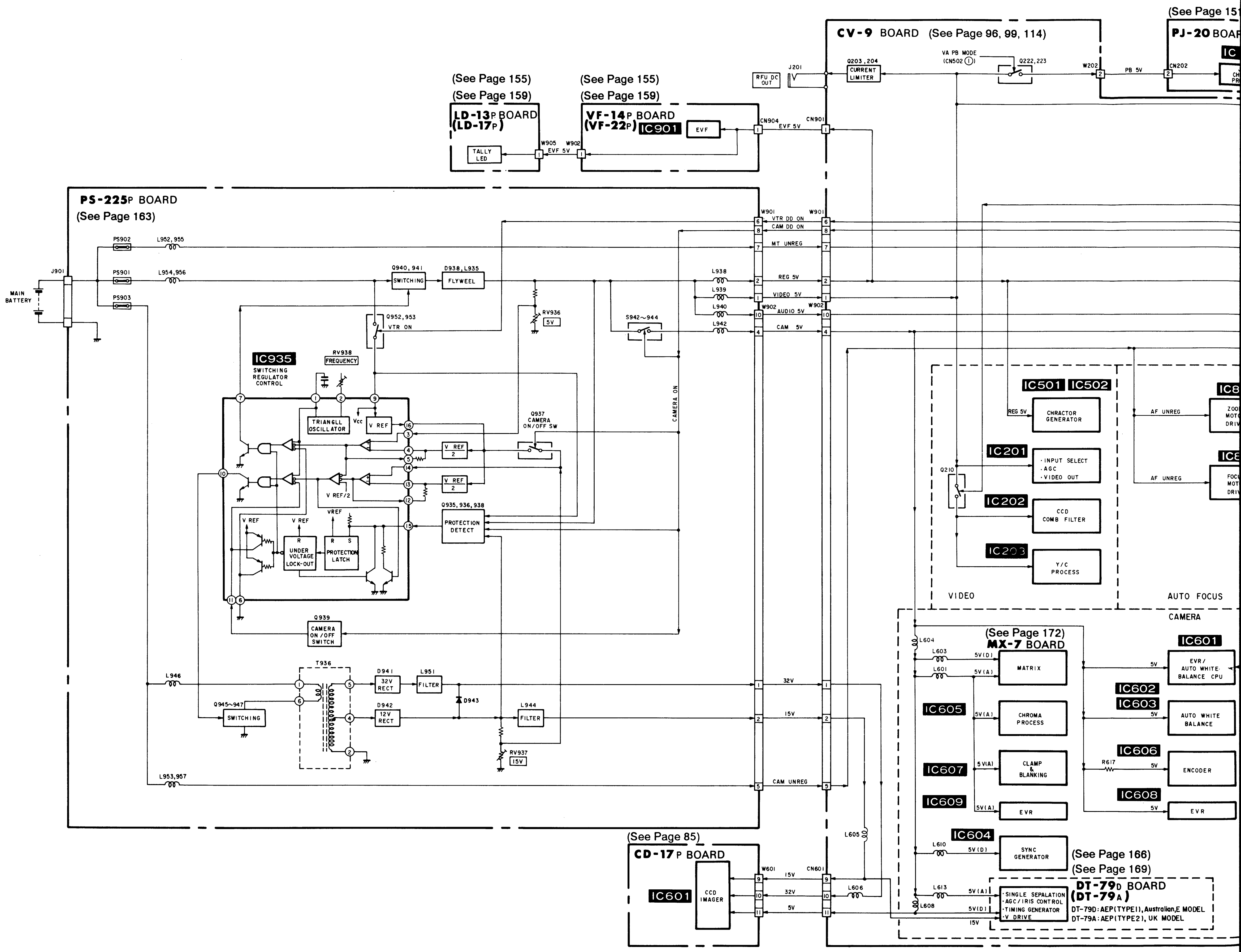


VF-14P BOARD
(See Page 155)
LD-13P BOARD
(See Page 155)
D902 TALLY
D901 TALLY
W905 W902
TALLY
SERVO/ SYSTEM CONTROL (CV-9)
TALLY
CN904
VIDEO(1) (EVF OUT (CV-9)
IC901
IC901 ⑨
0.9Vp-p
H
IC901 ⑪
2.8Vp-p
IC901 ⑭
2Vp-p
RV901 H FREQ
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
V FREQ
R912, 913 C908
RV902 V SIZE
R929~932
CONTRAST CONTROL
Q903 VIDEO DRIVE
Q904 VIDEO OUT
Q904 Ⓔ
8Vp-p
Q905 H.OUT
C911 H SIZE
+5V
T901 FBT
D903 DUMPER
RV904 BRIGHT
IC901 ⑤
IC901 ③
V
L903 (HLC)
W901
G1
H
HV
G2
CRT
CN903
DH1
DH2
L901 DY
CN902
DV1
DV2

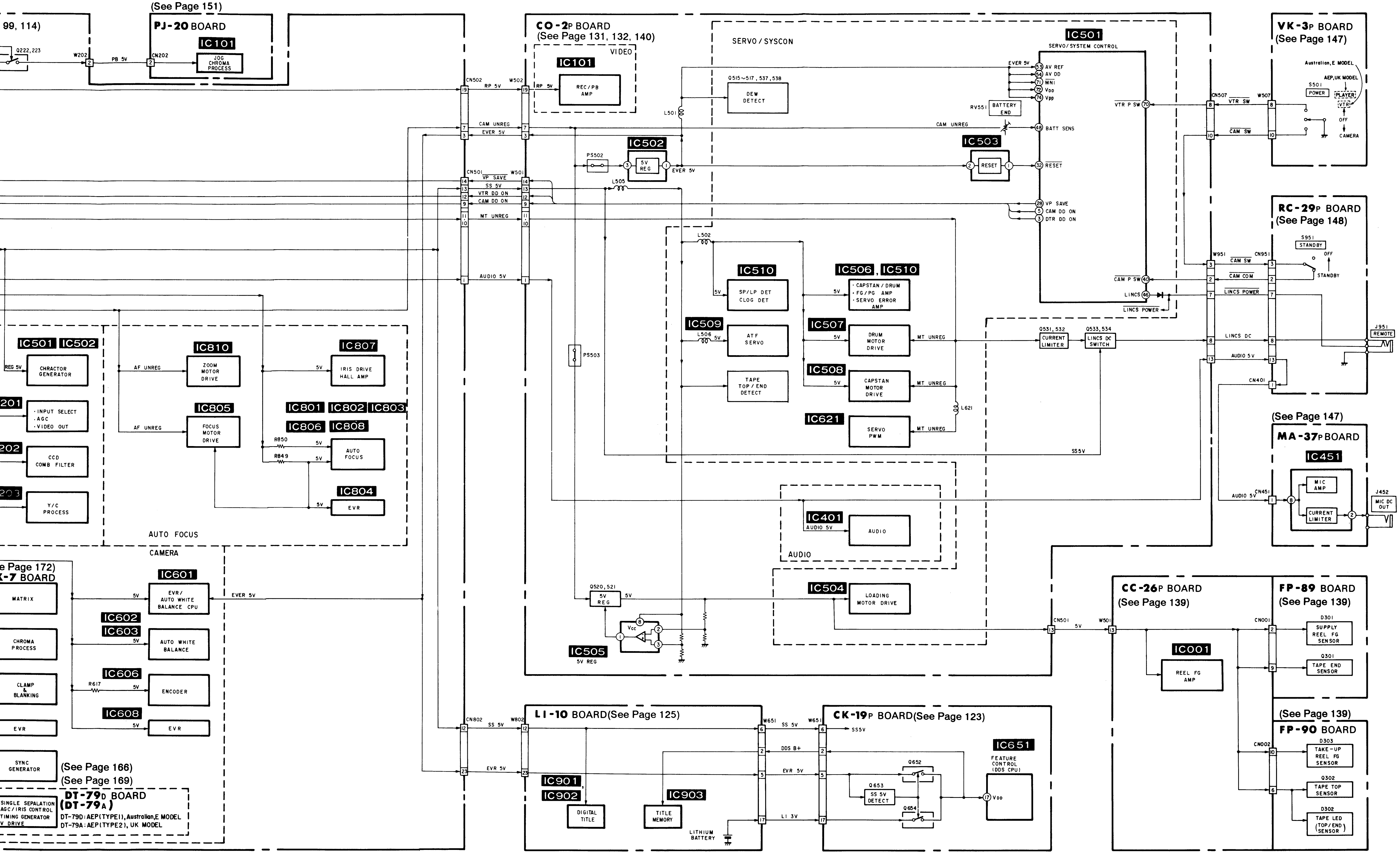
D902 TALLY
LD-17P BOA
(See Page 159)
SERV
SYSTEM CONTR
(CV-
VIDE


VF-22P BOARD
(See Page 159)
LD-17P BOARD
(See Page 159)
D902 TALLY
D901 TALLY
W905 W902
TALLY
SERVO/ SYSTEM CONTROL (CV-9)
TALLY
W904
VIDEO(1) EVF OUT (CV-9)
IC901 ⑪
2.8Vp-p
H
IC901 ⑨
0.9Vp-p
IC901 ⑭
2Vp-p
RV901 AFC
IC901
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
V FREQ
R925,926 C919
CP901 V SIZE
CP901 CONTRAST
Q904 VIDEO OUT
Q903 H.OUT
C905 H SIZE
+5V
T901 FBT
D903 DUMPER
RV901 FOCUS
CP901 BRIGHT
L903 (HLC)
IC901 ⑤
IC901 ③
V
W901
G1
H1
H2
HV
G3
G2
CRT
CN901
DH1
DH2
L901 DY
CN902
DV1
DV2

3-12. POWER BLOCK DIAGRAM



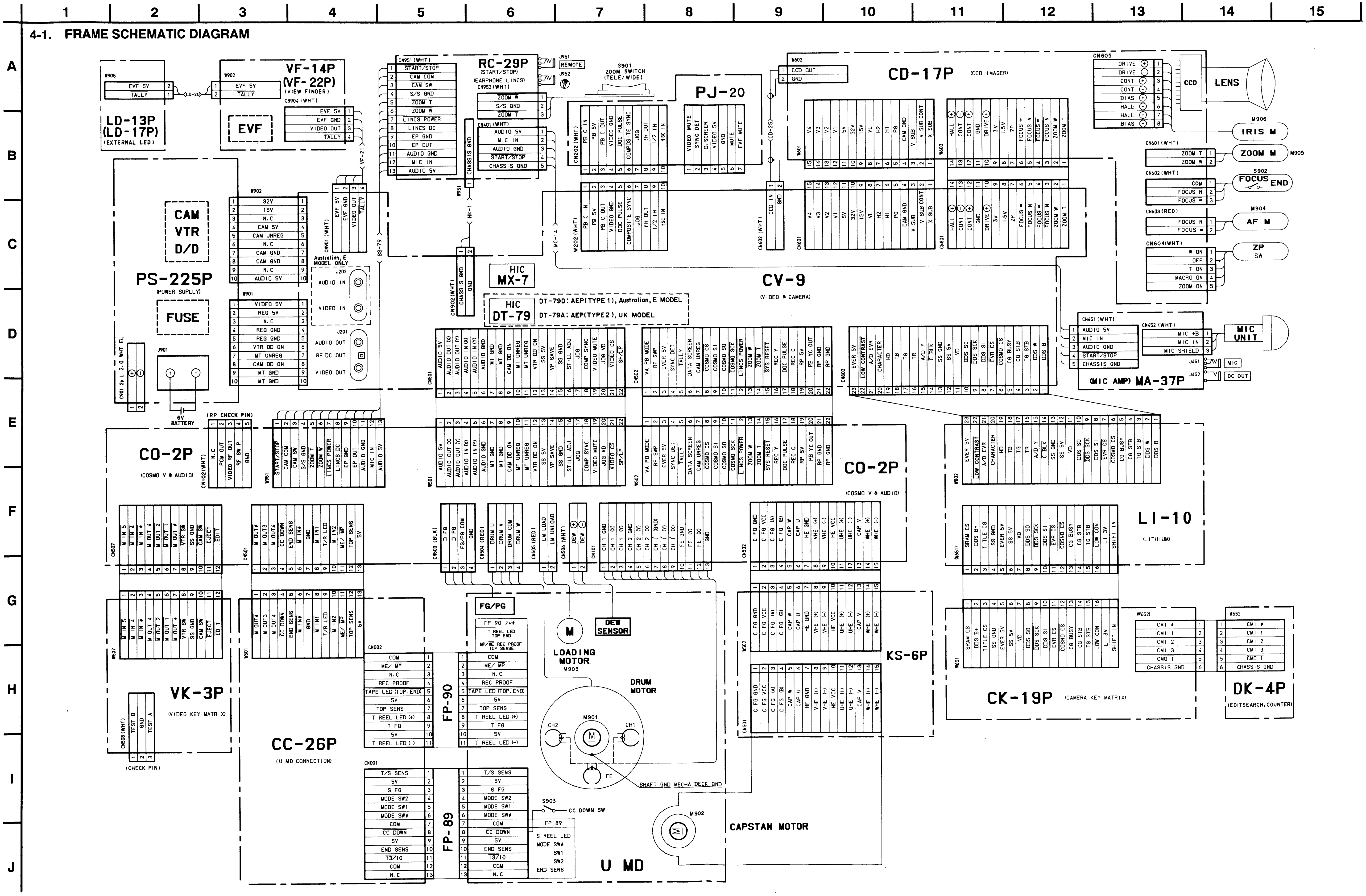
(See Page 15
PJ-20 BOAR
CV-9 BOARD (See Page 96, 99, 114)
Q203, 204 CURRENT LIMITER
VA PB MODE (CN502 ①)
Q222, 223
W202
PB 5V
CN202
J201
RFU DC OUT
(See Page 155)
(See Page 159)
LD-13P BOARD
(LD-17P)
TALLY LED
W905
W902
EVF 5V
(See Page 155)
(See Page 159)
VF-14P BOARD
(VF-22P)
IC901
EVF
CN904
EVF 5V
CN901
PS-225P BOARD
(See Page 163)
MAIN BATTERY
J901
PS902
L952, 955
PS901
L954, 956
PS903
Q940, 941
SWITCHING
D938, L935
FLYWEEL
Q952, 953
VTR ON
RV936
5V
S942~944
L938
L939
L940
L942
W901
VTR DD ON
CAM DD ON
MT UNREG
REG 5V
VIDEO 5V
W902
AUDIO 5V
CAM 5V
IC935
SWITCHING REGULATOR CONTROL
RV938
FREQUENCY
TRIANGLL OSCILLATOR
Vcc
V REF
V REF 2
V REF/2
VREF
UNDER VOLTAGE LOCK-OUT
PROTECTION LATCH
R
S
Q937
CAMERA ON/OFF SW
CAMERA ON
Q935, 936, 938
PROTECTION DETECT
Q939
CAMERA ON/OFF SWITCH
T936
L946
Q945~947
SWITCHING
D941
32V RECT
L951
FILTER
D943
D942
12V RECT
L944
FILTER
RV937
15V
32V
15V
L953, 957
CAM UNREG
IC501
IC502
REG 5V
CHRACTOR GENERATOR
IC201
INPUT SELECT
AGC
VIDEO OUT
Q210
IC202
CCD COMB FILTER
IC203
Y/C PROCESS
VIDEO
AF UNREG
ZOOM MOTOR DRIVE
FOCUS MOTOR DRIVE
AUTO FOCUS
CAMERA
L604
(See Page 172)
MX-7 BOARD
L603
5V(D)
L601
5V(A)
MATRIX
IC601
EVR/AUTO WHITE BALANCE CPU
5V
IC602
IC603
AUTO WHITE BALANCE
IC605
CHROMA PROCESS
IC607
CLAMP & BLANKING
IC606
R617
ENCODER
IC609
EVR
IC608
EVR
L605
IC604
L610
SYNC GENERATOR
(See Page 166)
(See Page 169)
(See Page 85)
CD-17P BOARD
IC601
CCD IMAGER
W601
CN601
L606
L613
L608
5V(A)
5V(D)
DT-79D BOARD
(DT-79A)
SINGLE SEPALATION
AGC/IRIS CONTROL
TIMING GENERATOR
V DRIVE
DT-79D:AEP(TYPE1), Australian, E MODEL
DT-79A:AEP(TYPE2), UK MODEL


(See Page 151)
PJ-20 BOARD
IC101
JOG CHROMA PROCESS
99, 114)
Q222,223
PB 5V
CO-2P BOARD
(See Page 131, 132, 140)
VIDEO
IC101
REC/PB AMP
RP 5V
CAM UNREG
EVER 5V
VP SAVE
SS 5V
VTR DD ON
CAM DD ON
MT UNREG
AUDIO 5V
SERVO/SYSCON
Q515~517, 537, 538
DEW DETECT
IC501
SERVO/SYSTEM CONTROL
AV REF
AV DD
MNI
VDD
VPP
BATTERY END
RV551
BATT SENS
IC502
5V REG
PS502
L501
L505
IC503
RESET
VP SAVE
CAM DD ON
DTR DD ON
VTR P SW
CAM P SW
LINCS
LINCS POWER
L502
IC510
SP/LP DET CLOG DET
IC506, IC510
CAPSTAN/DRUM FG/PG AMP SERVO ERROR AMP
IC509
L506
ATF SERVO
IC507
DRUM MOTOR DRIVE
TAPE TOP/END DETECT
IC508
CAPSTAN MOTOR DRIVE
IC621
SERVO PWM
L621
PS503
Q531, 532
CURRENT LIMITER
Q533, 534
LINCS DC SWITCH
SS5V
IC401
AUDIO
IC504
LOADING MOTOR DRIVE
Q520, 521
5V REG
IC505
5V REG
VK-3P BOARD
(See Page 147)
Australian, E MODEL
AEP, UK MODEL
S501
POWER
PLAYER
VTR
OFF
CAMERA
CAM SW
RC-29P BOARD
(See Page 148)
S951
STANDBY
CAM COM
LINCS DC
J951
REMOTE
(See Page 147)
MA-37P BOARD
IC451
MIC AMP
CURRENT LIMITER
J452
MIC DC OUT
IC501 IC502
CHRACTOR GENERATOR
201
INPUT SELECT
AGC
VIDEO OUT
202
CCD COMB FILTER
203
Y/C PROCESS
IC810
ZOOM MOTOR DRIVE
AF UNREG
IC805
FOCUS MOTOR DRIVE
IC807
IRIS DRIVE HALL AMP
IC801 IC802 IC803
IC806 IC808
AUTO FOCUS
R850
R849
IC804
EVR
AUTO FOCUS
CAMERA
e Page 172)
-7 BOARD
MATRIX
CHROMA PROCESS
CLAMP & BLANKING
EVR
SYNC GENERATOR
IC601
EVR/ AUTO WHITE BALANCE CPU
IC602
IC603
AUTO WHITE BALANCE
IC606
R617
ENCODER
IC608
(See Page 166)
(See Page 169)
DT-79D BOARD
(DT-79A)
DT-79D: AEP(TYPE1), Australian, E MODEL
DT-79A: AEP(TYPE2), UK MODEL
SINGLE SEPALATION
AGC/IRIS CONTROL
TIMING GENERATOR
V DRIVE
LI-10 BOARD (See Page 125)
IC901,
IC902
DIGITAL TITLE
IC903
TITLE MEMORY
LITHIUM BATTERY
CK-19P BOARD (See Page 123)
DDS B+
EVR 5V
LI 3V
Q652
Q653
SS 5V DETECT
Q654
IC651
FEATURE CONTROL (DDS CPU)
VDD
CC-26P BOARD
(See Page 139)
IC001
REEL FG AMP
FP-89 BOARD
(See Page 139)
D301
SUPPLY REEL FG SENSOR
Q301
TAPE END SENSOR
(See Page 139)
FP-90 BOARD
D303
TAKE-UP REEL FG SENSOR
Q302
TAPE TOP SENSOR
D302
TAPE LED (TOP/END) SENSOR

SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM

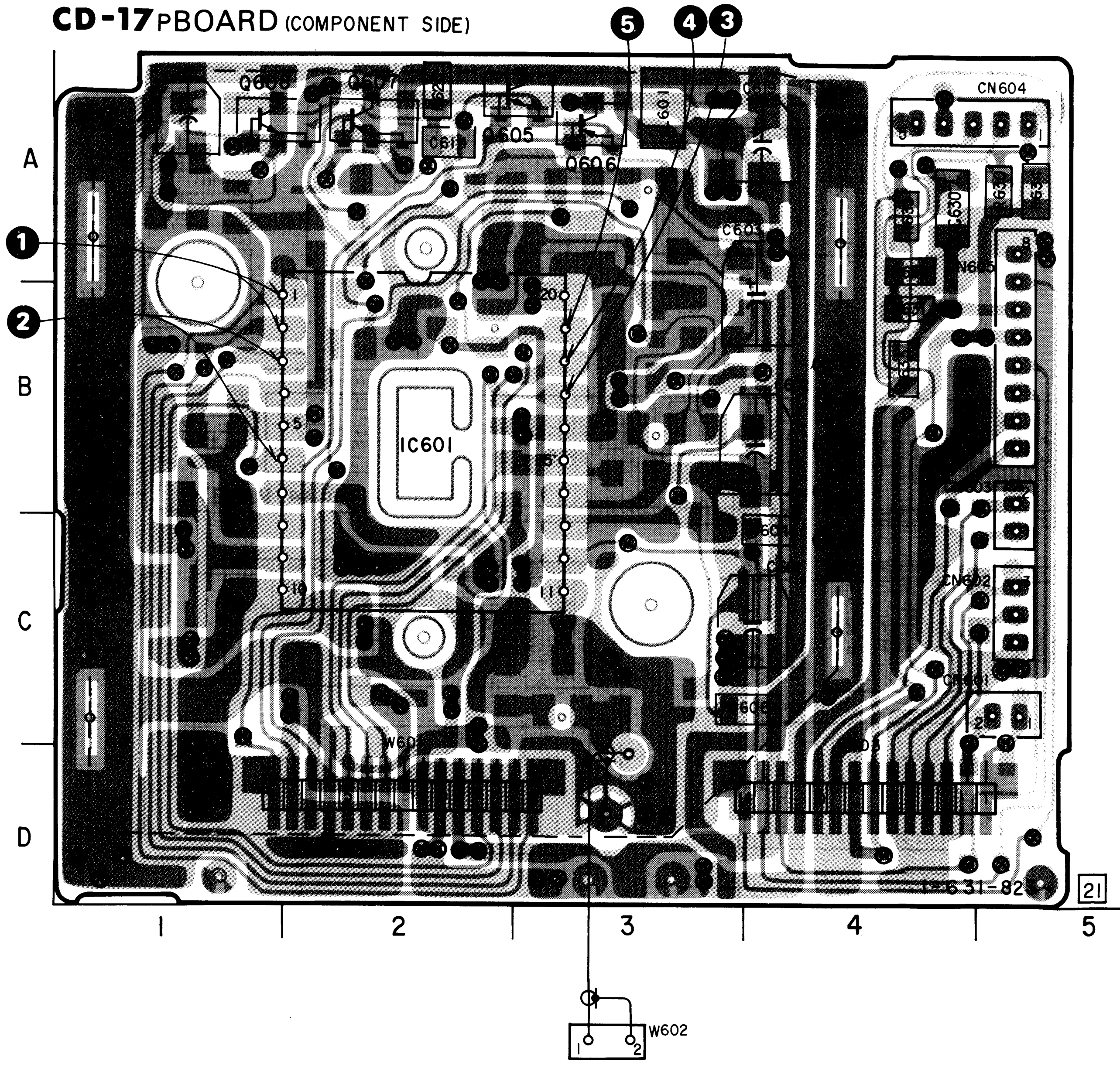

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
LD-13P
(LD-17P)
(EXTERNAL LED)
EVF 5V
TALLY
VF-14P
(VF-22P)
(VIEW FINDER)
EVF
CN904 (WHT)
EVF 5V
EVF GND
VIDEO OUT
TALLY
VF-21
CAM
VTR
D/D
PS-225P
(POWER SUPPLY)
FUSE
32V
15V
N.C
CAM 5V
CAM UNREG
CAM GND
AUDIO 5V
VIDEO 5V
REG 5V
REG GND
VTR DD ON
MT UNREG
MT GND
J901
6V BATTERY
C901 2s L 2.0 WHT EL
Australian, E MODEL ONLY
J202
AUDIO IN
VIDEO IN
J201
AUDIO OUT
RF DC OUT
VIDEO OUT
CN901 (WHT)
SS-79
CN951 (WHT)
START/STOP
CAM COM
CAM SW
S/S GND
ZOOM T
ZOOM W
LINCS POWER
LINCS DC
EP GND
EP OUT
AUDIO GND
MIC IN
AUDIO 5V
RC-29P
(START/STOP)
(EARPHONE LINCS)
J951
REMOTE
J952
CN952 (WHT)
S/S GND
CN401 (WHT)
AUDIO 5V
MIC IN
AUDIO GND
START/STOP
CHASSIS GND
HK-1
CN902 (WHT)
CHASSIS GND
HIC
MX-7
HIC
DT-79
DT-79D: AEP (TYPE 1), Australian, E MODEL
DT-79A: AEP (TYPE 2), UK MODEL
S901
ZOOM SWITCH
(TELE/WIDE)
PJ-20
MC-14
CN202 (WHT)
PB C IN
PB 5V
PB C OUT
VIDEO GND
DOC PULSE
COMPOSITE SYNC
JOG
fH OUT
1/2 fH
fsc IN
VIDEO MUTE
SYNC DET
D.SCREEN
VIDEO 5V
GND
MUTE
EVF MUTE
CD-25
CN402 (WHT)
CCD IN
GND
W602
CCD OUT
CD-17P
(CCD IMAGER)
V4
V3
V2
V1
5V
32V
15V
VL
H2
H1
PG
CAM GND
V SUB
V SUB CONT
X SUB
HALL
CONT
DRIVE
3V
1.5V
ZP
FOCUS
ZOOM W
ZOOM T
CV-9
(VIDEO & CAMERA)
CN605
DRIVE
BIAS
CCD
LENS
M906
IRIS M
CN601 (WHT)
ZOOM M
M905
CN602 (WHT)
S902
FOCUS END
COM
FOCUS N
CN603 (RED)
M904
AF M
CN604 (WHT)
W ON
OFF
T ON
MACRO ON
ZOOM ON
ZP SW
CN451 (WHT)
CN452 (WHT)
MIC +B
MIC SHIELD
MIC UNIT
J451
MIC
J452
DC OUT
(MIC AMP) MA-37P
CN501
AUDIO OUT
AUDIO IN
MT GND
CAM DD ON
MT UNREG
VTR DD ON
SS 5V
VP SAVE
SS GND
STILL ADJ
COMP SYNC
VIDEO MUTE
JOG VD
VIDEO CS
SP/LP
CN502
VA PB MODE
RF SWP
EVER 5V
SYNC DET
TALLY
DATA SCREEN
CAM UNREG
COSMO CS
COSMO SO
COSMO SI
COSMO SCK
LINCS POWER
SYS RESET
REC Y
DOC PULSE
REC C
RP 5V
PB YC OUT
RP GND
CN802
LOW CONTRAST
A/D EVR
CHARACTER
HD
TB
TG
TR
A/D Y
C BLK
SS GND
VD
DDS SO
DDS SCK
DDS SI
EVR CS
CG BUSY
CG STB
TG STB
DDS W
DDS B
(RP CHECK PIN)
CN102 (WHT)
PCM OUT
VIDEO RF OUT
RF SW P
CO-2P
(COSMO V & AUDIO)
W951
W501
W502
W802
LI-10
(LITHIUM)
CN507
M IN 5
M IN 4
M IN #
M OUT 4
M OUT 2
M OUT 1
VTR SW
CAM SW
EJECT
EDIT
CN501
M OUT#
M OUT3
M OUT4
CC DOWN
END SENS
M IN#
M INT
T/R LED
M IN2
ME/MP
TOP SENS
CN503 (BLK)
D FG
D PG
FG/PG COM
CN504 (RED)
DRUM U
DRUM V
DRUM COM
DRUM W
CN505 (RED)
LM LOAD
LM UNLOAD
CN506 (WHT)
DEW
CN101
CH 1 GND
CH 1 (Y)
CH 2 GND
CH 2 (Y)
CH 1 (X)
FE GND
FE (Y)
FE (X)
C FG GND
C FG VCC
C FG (A)
C FG (B)
CAP W
CAP U
HE GND
VHE (+)
VHE (-)
HE VCC
UHE (+)
UHE (-)
CAP V
WHE (+)
WHE (-)
KS-6P
CN651
SRAM CS
DDS B+
TITLE CS
LCD CON
LI 3V
SHIFT IN
VK-3P
(VIDEO KEY MATRIX)
CN508 (WHT)
TEST B
TEST A
(CHECK PIN)
CC-26P
(U MD CONNECTION)
CN002
COM
ME/MP
REC PROOF
TAPE LED (TOP. END)
TOP SENS
T REEL LED (+)
T FG
T REEL LED (-)
FP-90
CN001
T/S SENS
S FG
MODE SW2
MODE SW1
MODE SW#
CC DOWN
13/10
FP-89
FG/PG
T REEL LED
TOP END
MP/ME REC PROOF
TOP SENSE
LOADING MOTOR
M903
DEW SENSOR
DRUM MOTOR
M901
CH2
CH1
FE
SHAFT GND MECHA DECK GND
S903
CC DOWN SW
S REEL LED
SW1
SW2
M902
CAPSTAN MOTOR
U MD
CK-19P (CAMERA KEY MATRIX)
W652
CMI #
CMI 1
CMI 2
CMI 3
CMO 1
DK-4P
(EDITSEARCH, COUNTER)

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

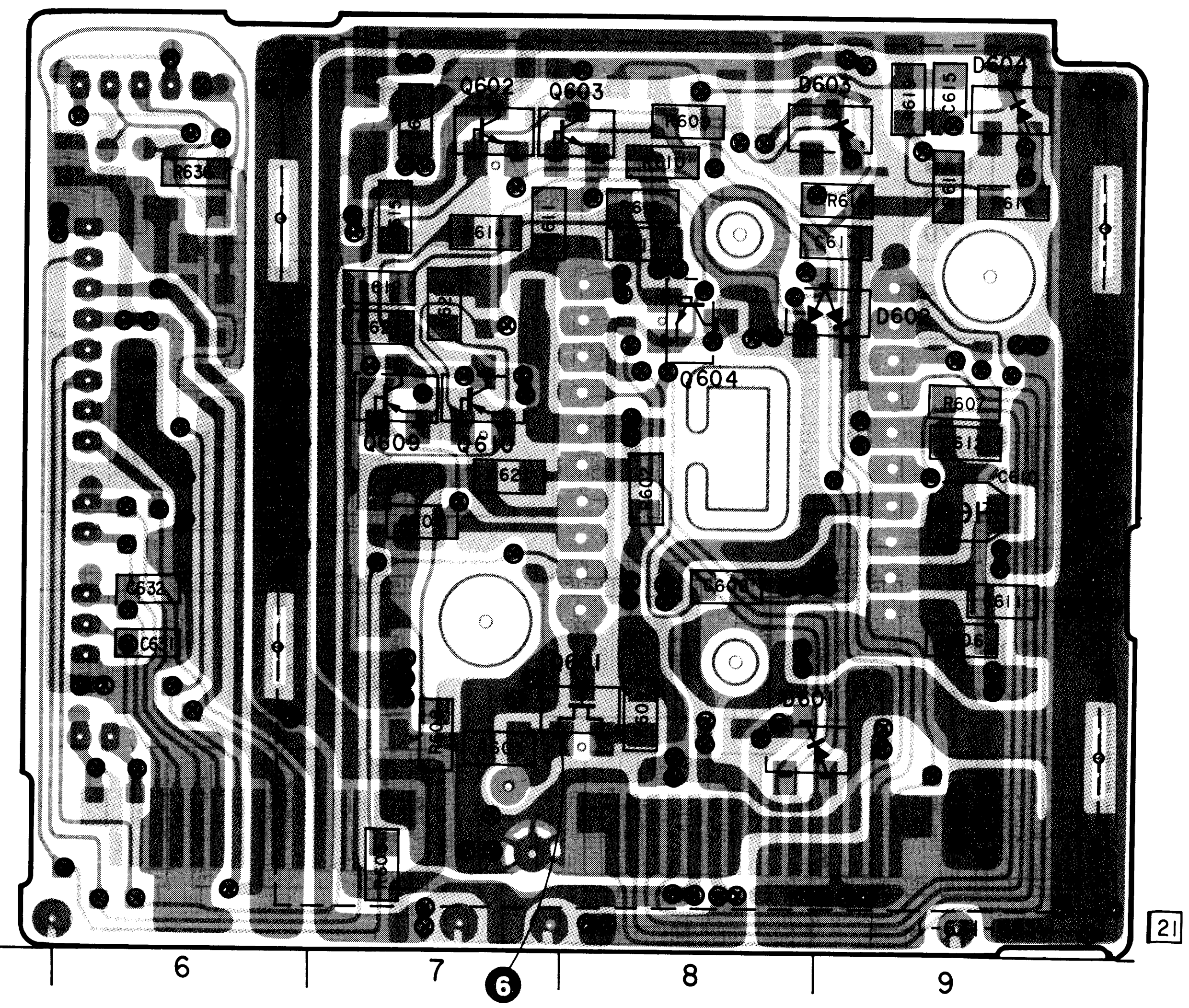
CD-17P (CCD IMAGER/ZOOM, FOCUS) PRINTED WIRING BOARDS

— Ref. No. CD-17P BOARD: 1000 series —

CD-17PBOARD (COMPONENT SIDE)


❺
❹
❸
❶
❷
A
B
C
D
Q608
Q607
Q605
Q606
C619
CN604
C603
IC601
CN605
CN603
CN602
CN601
W601
W602
1-631-82
21
1
2
3
4
5

CD-17PBOARD (CONDUCTOR SIDE)

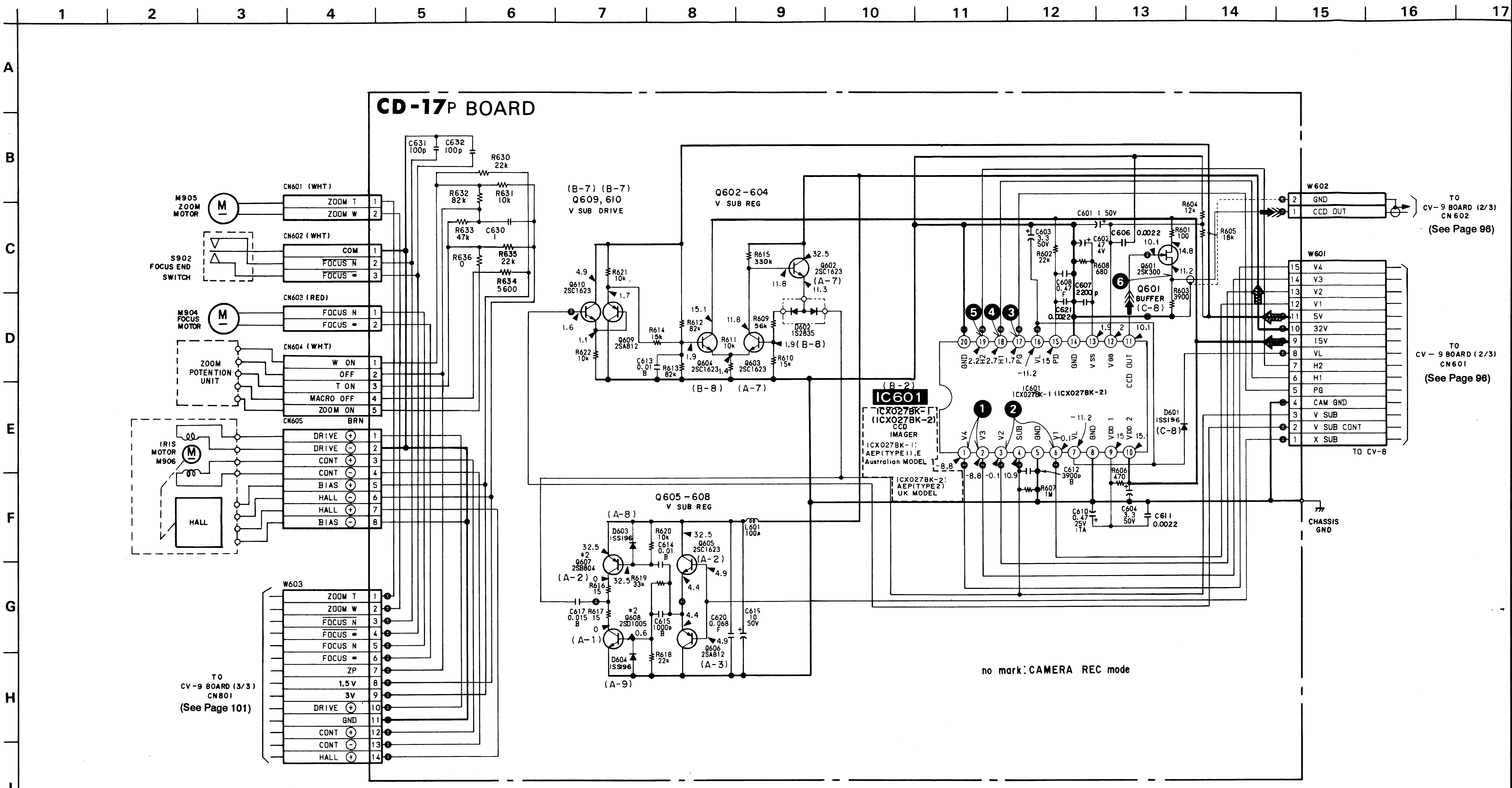

Q602
Q603
D603
D604
R634
D602
Q604
Q609
Q610
R607
C632
C651
D601
❻
21
6
7
8
9

CAUTIONS FOR REPLACEMENT OF CCD IMAGER

- When you replaced the CCD imager adjust the whole camera assembly.
- CCD imager has such a structure that it may be destructed by static electricity, so handle it with a care similar for MOS IC.
  Further, be cartain that the light receiving part has no stick of dust and no entry of bright light.

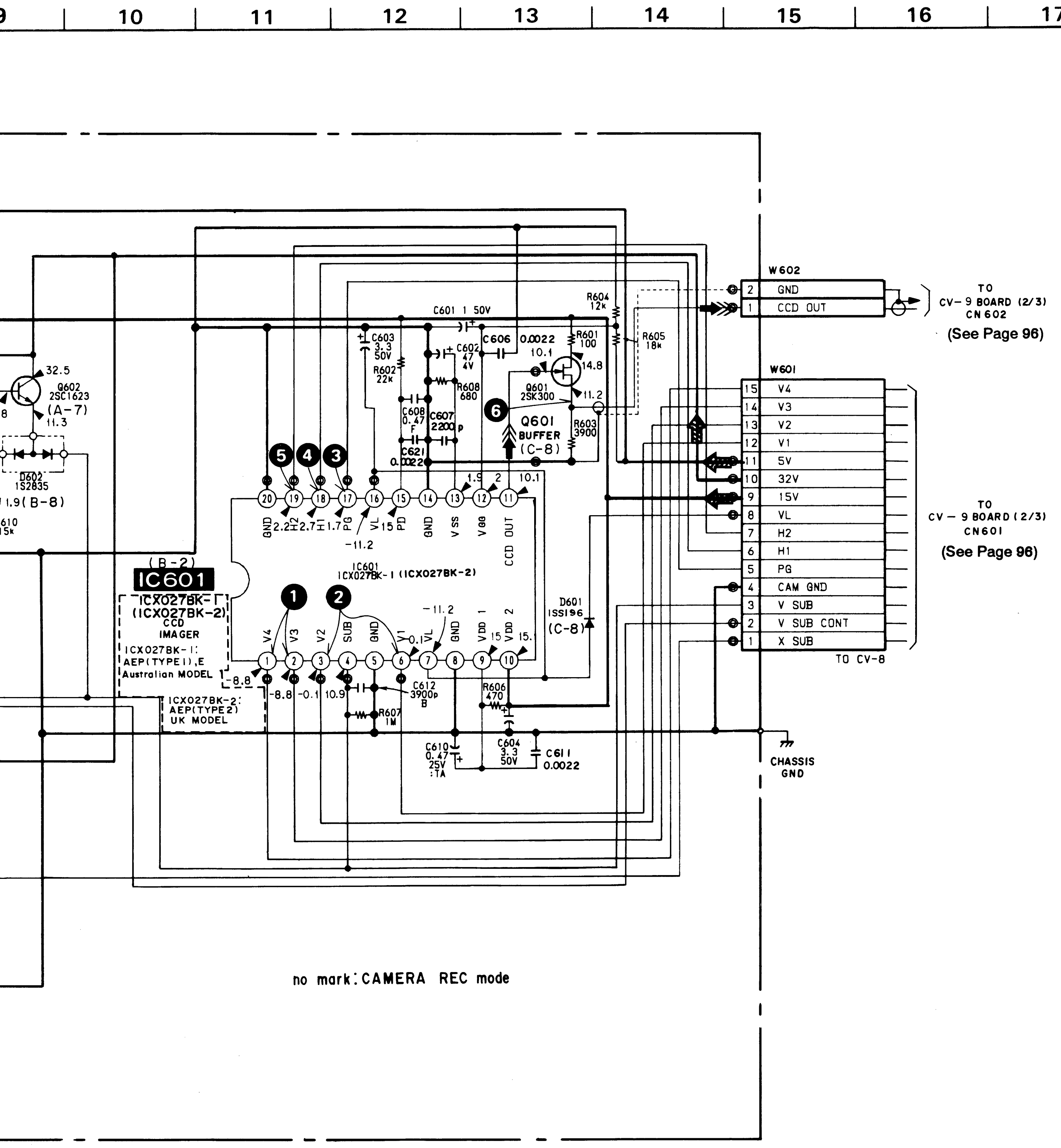
CD-17P (CCD IMAGER/ZOOM, FOCUS) SCHEMATIC DIAGRAMS

— Ref. No. CD-17P BOARD: 1000 series —


CD-17P BOARD
M905 ZOOM MOTOR
S902 FOCUS END SWITCH
M904 FOCUS MOTOR
ZOOM POTENTION UNIT
IRIS MOTOR M906
HALL
CN601 (WHT)
ZOOM T
ZOOM W
CN602 (WHT)
COM
FOCUS N
FOCUS ∞
CN603 (RED)
CN604 (WHT)
W ON
OFF
T ON
MACRO OFF
ZOOM ON
CN605 BRN
DRIVE ⊕
DRIVE ⊖
CONT ⊕
CONT ⊖
BIAS ⊕
HALL ⊖
HALL ⊕
BIAS ⊖
W603
ZP
1.5V
3V
GND
HALL ⊕
TO CV-9 BOARD (3/3) CN801
(See Page 101)
(B-7) (B-7) Q609, 610 V SUB DRIVE
Q602-604 V SUB REG
Q605-608 V SUB REG
IC601
ICX027BK-1 (ICX027BK-2) CCD IMAGER
ICX027BK-1: AEP(TYPE1),E Australian MODEL
ICX027BK-2: AEP(TYPE2) UK MODEL
Q601 BUFFER (C-8)
W602
GND
CCD OUT
TO CV-9 BOARD (2/3) CN602
(See Page 96)
W601
V4
V3
V2
V1
5V
32V
15V
VL
H2
H1
PG
CAM GND
V SUB
V SUB CONT
X SUB
TO CV-9 BOARD (2/3) CN601
(See Page 96)
TO CV-8
CHASSIS GND
no mark: CAMERA REC mode

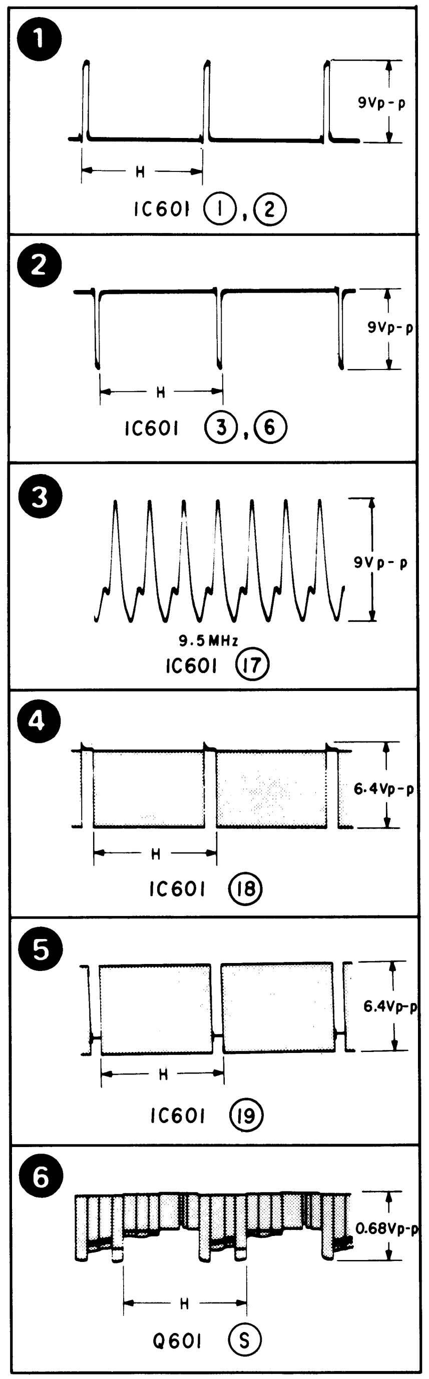
• **SIGNAL PATH**

	VIDEO SIGNA		
	CHROMA	Y	Y/C
REC			
PB			



9
10
11
12
13
14
15
16
17
18
W602
2 GND
1 CCD OUT
TO CV-9 BOARD (2/3) CN602
(See Page 96)
W601
15 V4
14 V3
13 V2
12 V1
11 5V
10 32V
9 15V
8 VL
7 H2
6 H1
5 PG
4 CAM GND
3 V SUB
2 V SUB CONT
1 X SUB
TO CV-8
TO CV-9 BOARD (2/3) CN601
(See Page 96)
CHASSIS GND
32.5
Q602 2SC1623
(A-7)
11.3
D602 1S2835
1.9(B-8)
R610 15k
C601 1 50V
R604 12k
R605 18k
C603 3.3 50V
R602 22k
C602 47 4V
C606 0.0022
R601 100
10.1
14.8
11.2
R608 680
Q601 2SK300
Q601 BUFFER (C-8)
R603 3900
C608 0.47 F
C607 2200p
C621 0.0022
1.9
2
10.1
GND
2.2
2.7
1.7
PG
VL
15
PD
GND
VSS
VGG
CCD OUT
-11.2
(B-2)
IC601
IC601 ICX027BK-1 (ICX027BK-2)
ICX027BK-1 (ICX027BK-2) CCD IMAGER
ICX027BK-1: AEP(TYPE1),E Australian MODEL
ICX027BK-2: AEP(TYPE2) UK MODEL
V4
V3
V2
SUB
GND
V1
GND
VDD
VDD
-11.2
0.1
15
15.
-8.8
-8.8
-0.1
10.9
D601 1SS196 (C-8)
C612 3900p B
R607 1M
R606 470
C610 0.47 25V :TA
C604 3.3 50V
C611 0.0022
no mark: CAMERA REC mode

CD-17P BOARD



- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC			➡>>	
PB				

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.
- ●— : indicated a lead wire mounted on the conductor side.
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ░ : Pattern of the rear side.
- Circled numbers refer to waveforms.

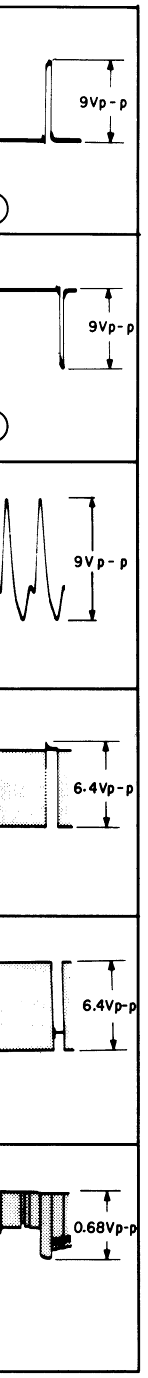
Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- — : B+ Line.
- ⇒ : IN/OUT direction of (+, –) B LINE.
- Circled numbers refer to waveforms.

Note: The components identi- fied by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.
- ●— : indicated a lead wire mounted on the conductor side.
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ░ : Pattern of the rear side.
- Circled numbers refer to waveforms.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

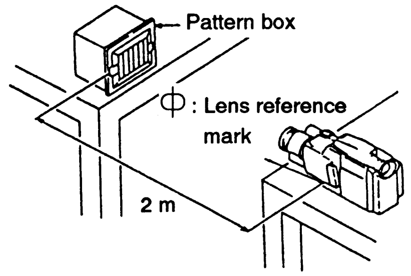
- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- — : B+ Line.
- ⇨ : IN/OUT direction of (+, –) B LINE.
- Circled numbers refer to waveforms.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- **Measuring conditions voltage value and waveform.**
  (CAMERA, DIGITAL TITLE, VIEW FINDER block)
- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.
  Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

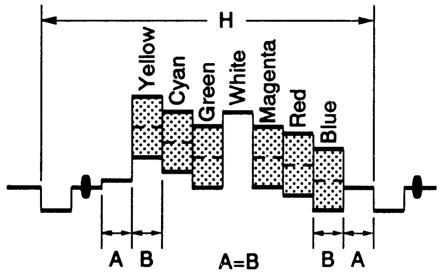


Fig. a (Video output terminal output waveform)

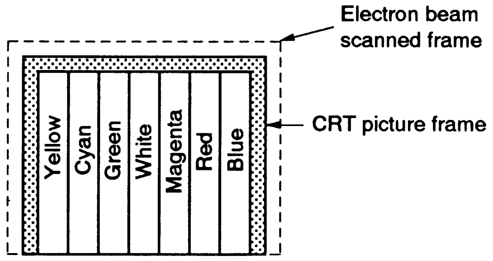


Fig. b (Picture on monitor TV)

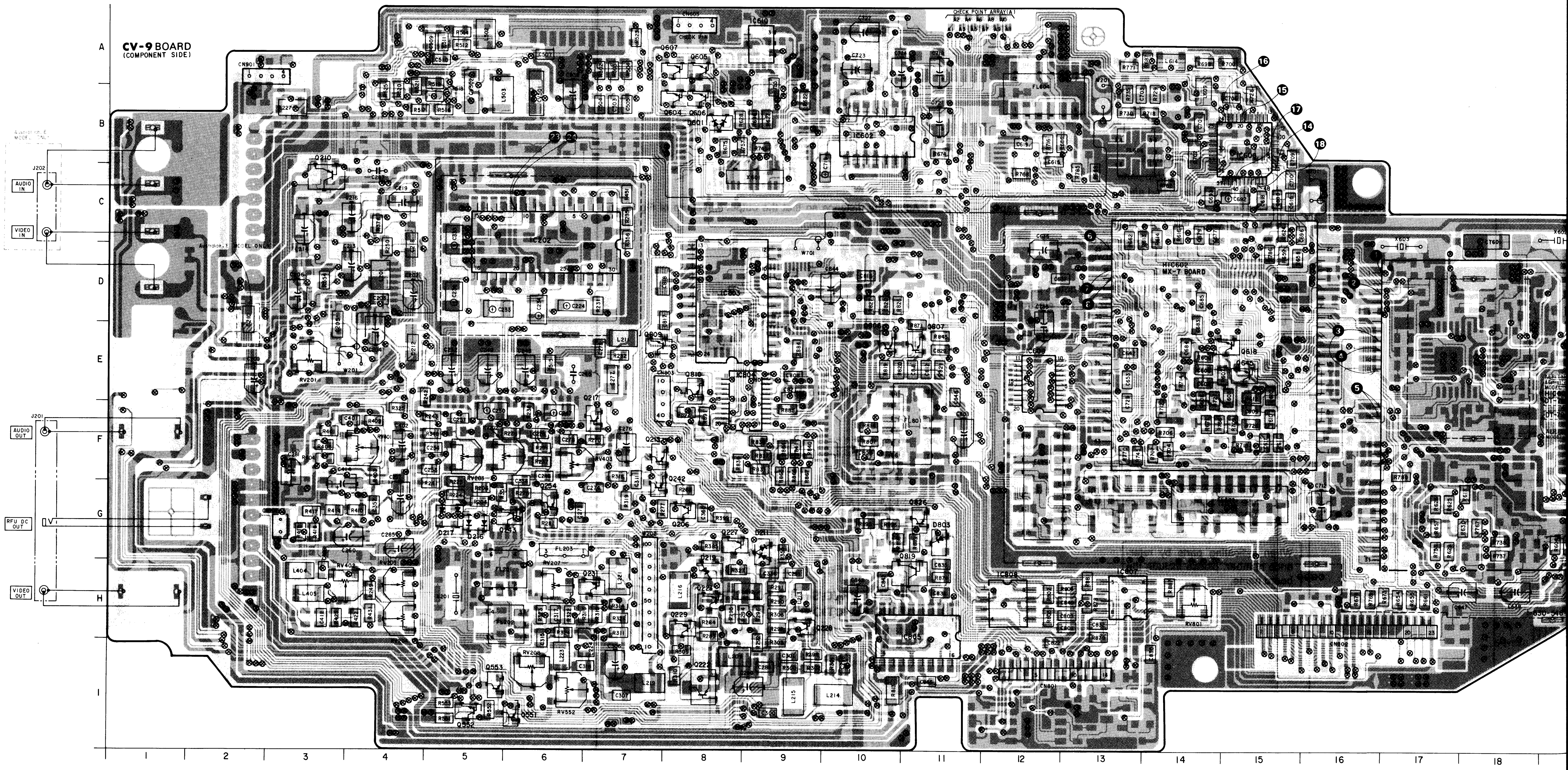
(VIDEO, SERVO/SYSTEM CONTROL, VIDEO FUNCTION)
- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

There are not the external input terminal (VIDEO/AUDIO IN) and REC switch in AEP, UK model. Accordingly, perform the following operation for signal input and REC mode.

Signal input	: Refer to VIDEO BLOCK ADJUSTMENTS (page 242, Fig. 9-2) for the video signal input method.
REC mode:	: Refer to the transition method to REC mode for the model without the external input terminal in the same Fig. 9-2.

CV-9 (CAMERA, VIDEO PROCESS) PRINTED WIRING BOARDS

— Ref. No. CV-9 BOARD: 2000 series —


CV-9 BOARD
(COMPONENT SIDE)
J202
AUDIO IN
VIDEO IN
J201
AUDIO OUT
RFU DC OUT
VIDEO OUT
A
B
C
D
E
F
G
H
I
1
2
3
4
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6
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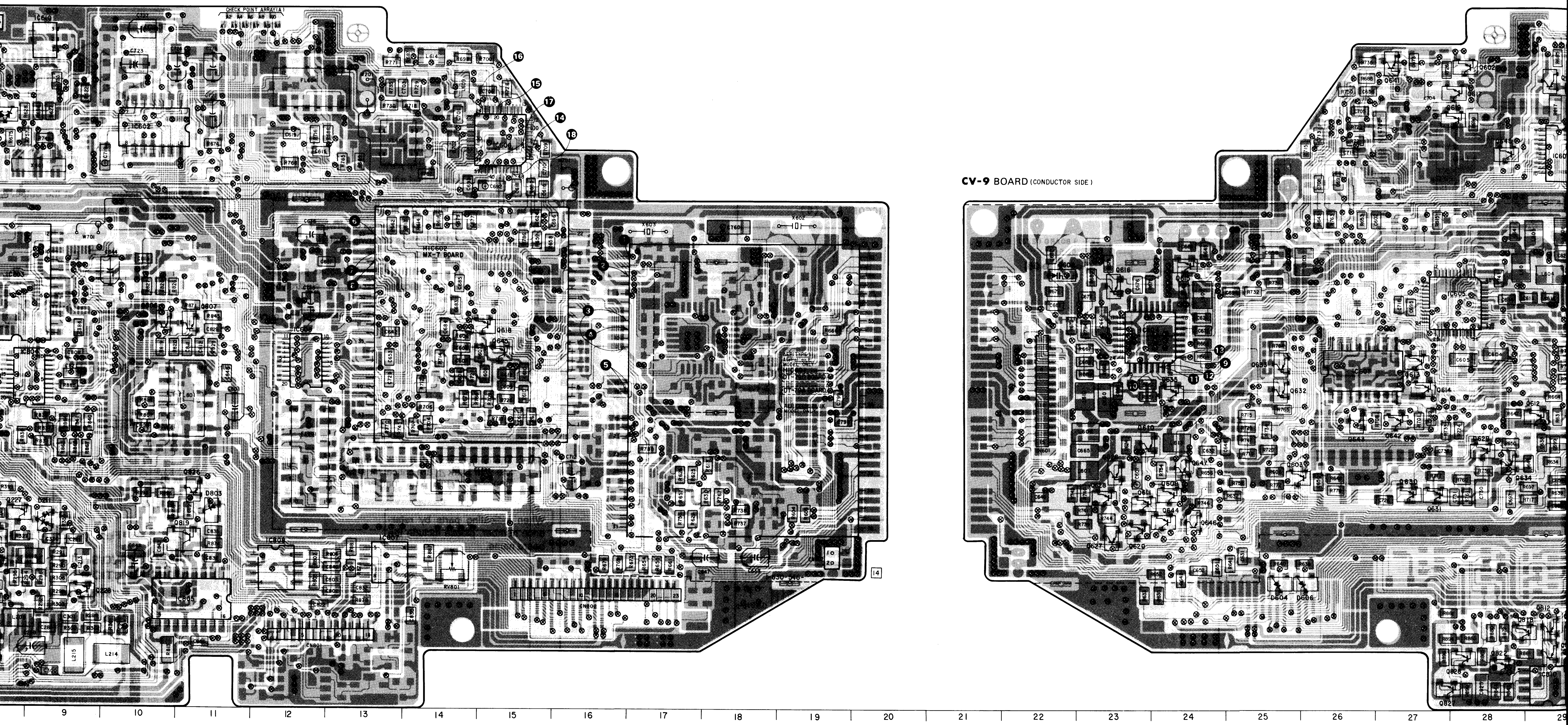
CV-9 BOARD (CONDUCTOR SIDE)



CHECK POINT ARRAY(A)
MX-7 BOARD
IC602
CN801
CN802
RV801
X603
X602
9
10
11
12
13
14
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16
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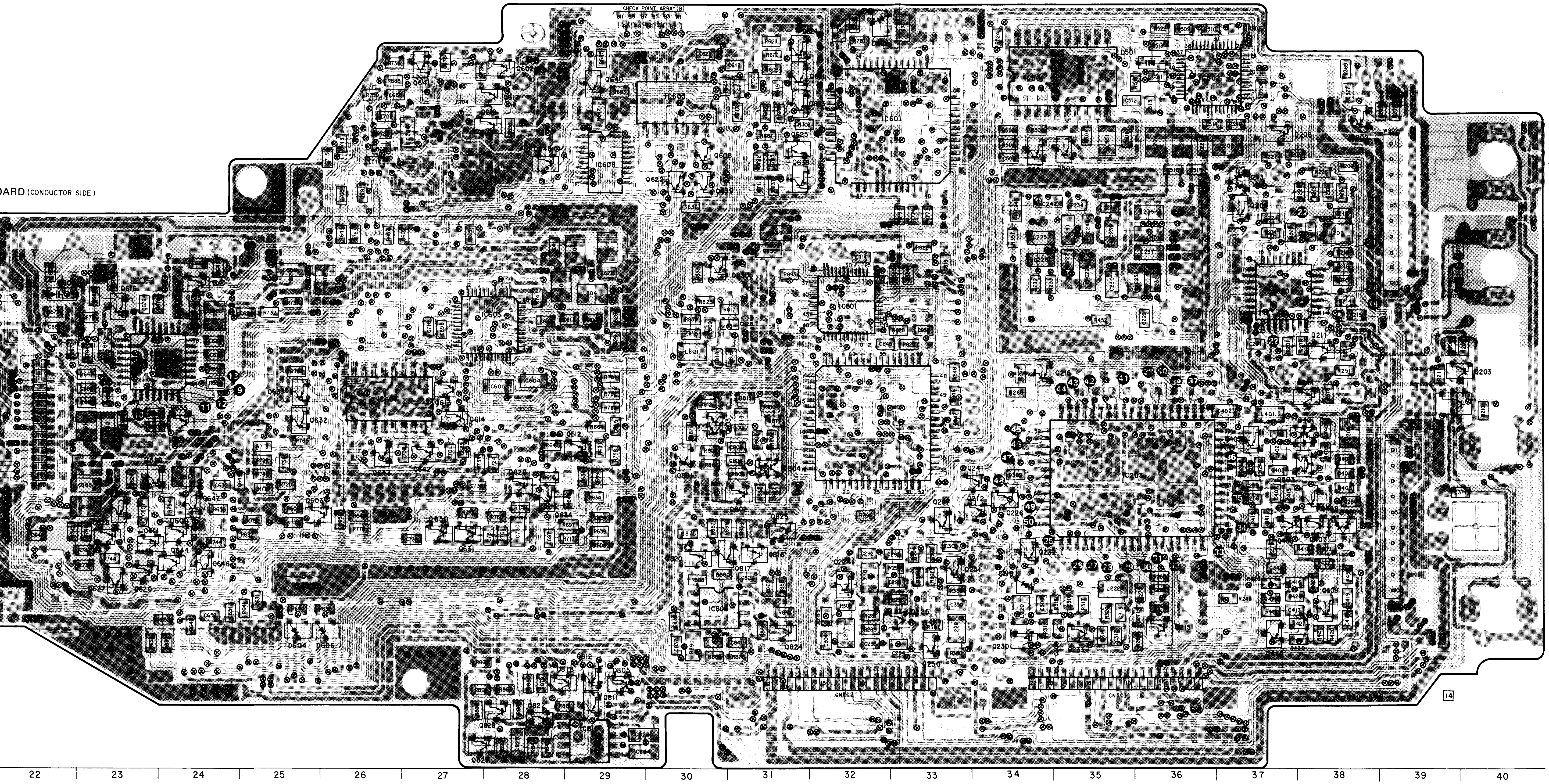
29

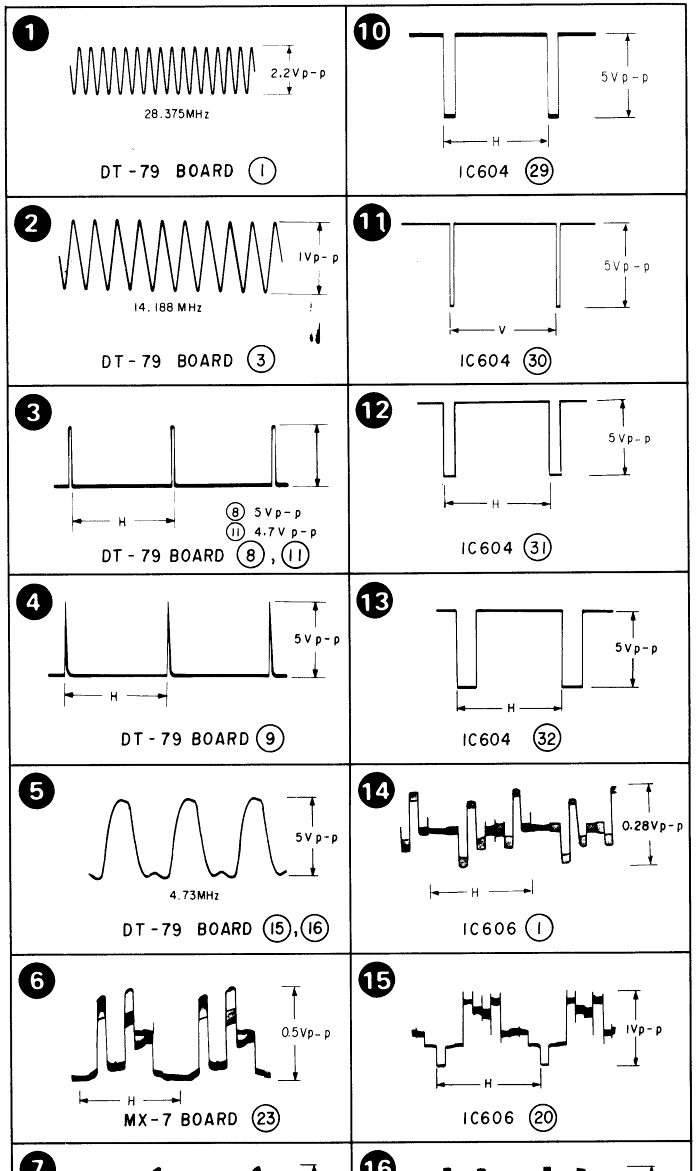
ARD (CONDUCTOR SIDE)


CHECK POINT ARRAY (B)
IC603
IC601
IC608
IC605
IC801
IC802
IC803
IC806
IC203
CN502
CN501
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

- **SIGNAL PATH**

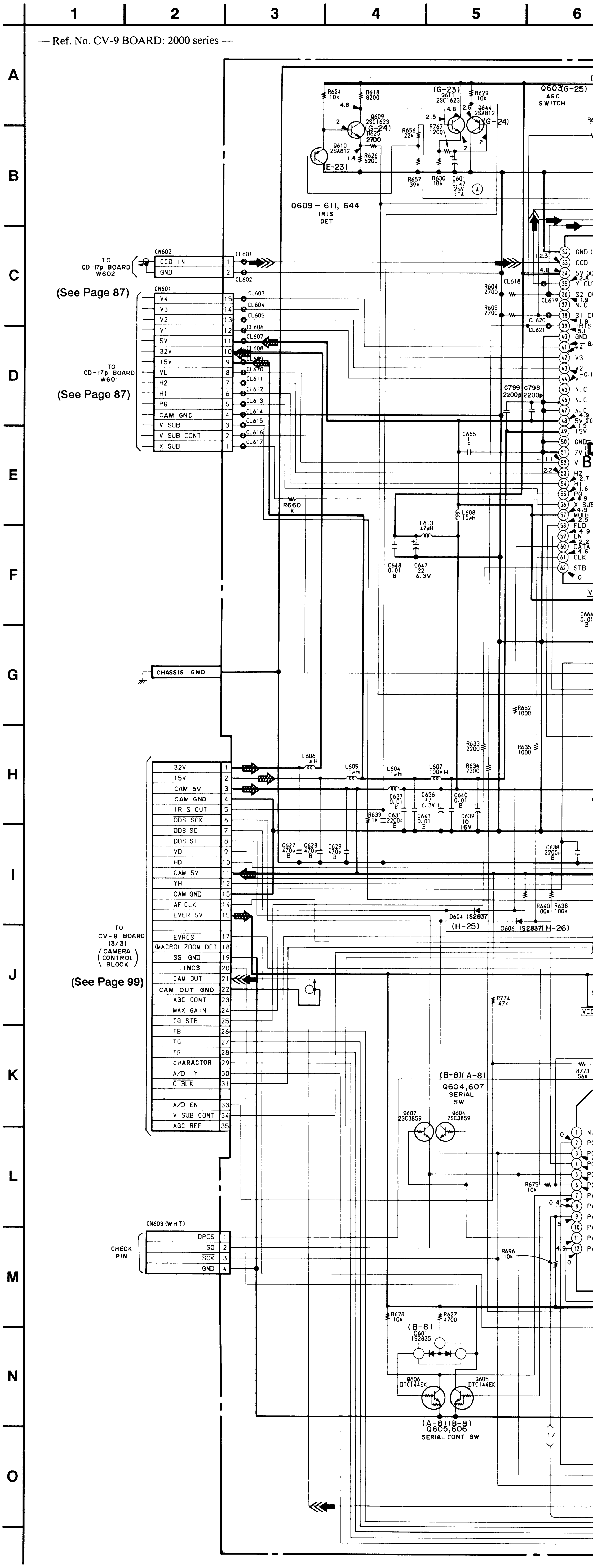
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	➡»	➡»»	
PB				

CV-9 BOARD (CAMERA)



CV-9 (CAMERA) SCHEMATIC DIAGRAMS

— Ref. No. CV-9 BOARD: 2000 series —



1
2
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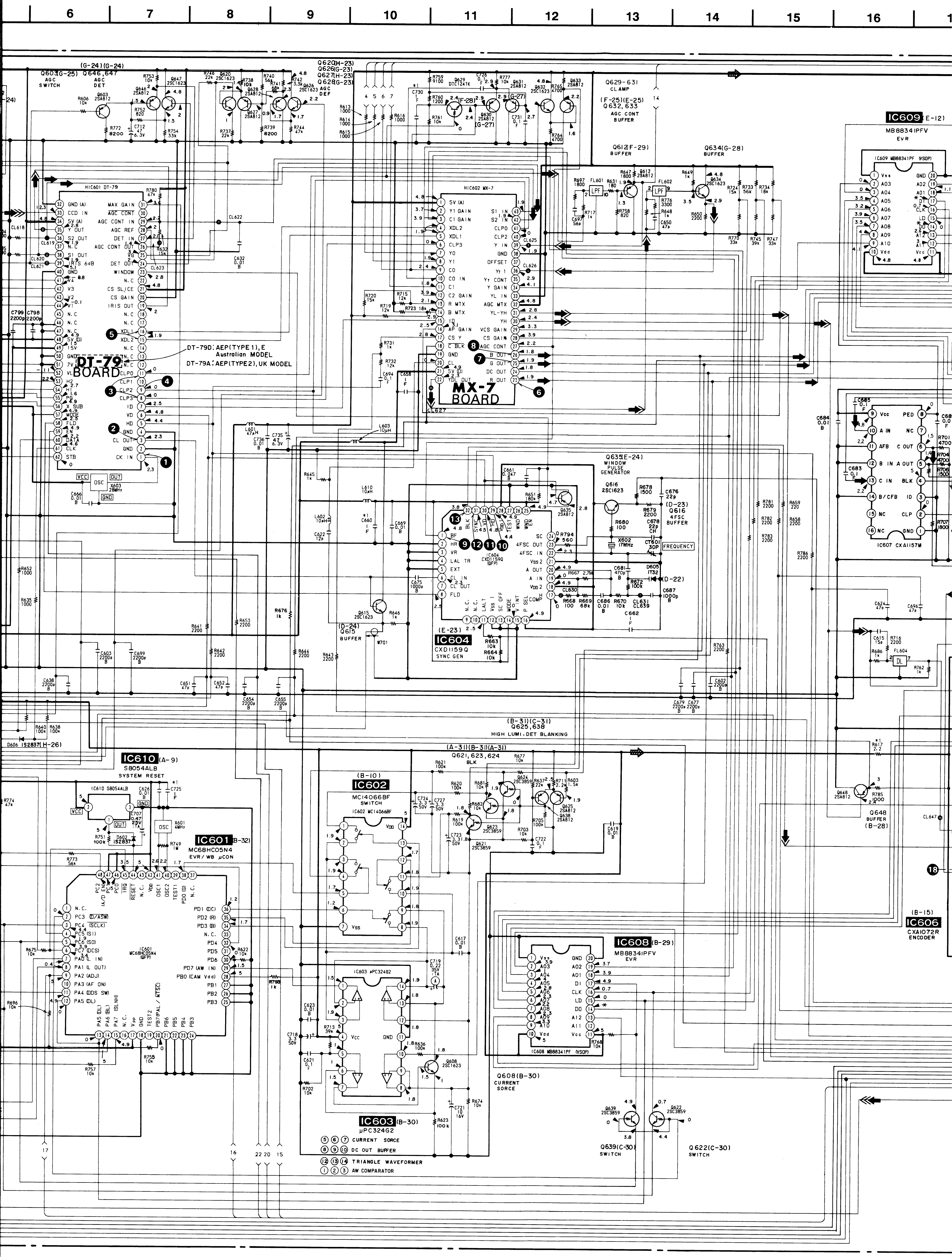
5
6
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
Q609-611, 644 IRIS DET
Q603 (G-25) AGC SWITCH
TO CD-17p BOARD W602 (See Page 87)
CN602 CCD IN GND
TO CD-17p BOARD W601 (See Page 87)
CN601 V4 V3 V2 V1 5V 32V 15V VL H2 H1 PG CAM GND V SUB V SUB CONT X SUB
CHASSIS GND
TO CV-9 BOARD (3/3) (CAMERA CONTROL BLOCK) (See Page 99)
32V 15V CAM 5V CAM GND IRIS OUT DDS SCK DDS SO DDS SI VD HD CAM 5V YH CAM GND AF CLK EVER 5V EVRCS (MACRO) ZOOM DET SS GND LINCS CAM OUT CAM OUT GND AGC CONT MAX GAIN TG STB TB TG TR CHARACTOR A/D Y C BLK A/D EN V SUB CONT AGC REF
CN603 (WHT) CHECK PIN DPCS SO SCK GND
Q604,607 SERIAL SW
Q605,606 SERIAL CONT SW
D604 1S2837 (H-25)
D606 1S2837 (H-26)
D601 1S2835


6
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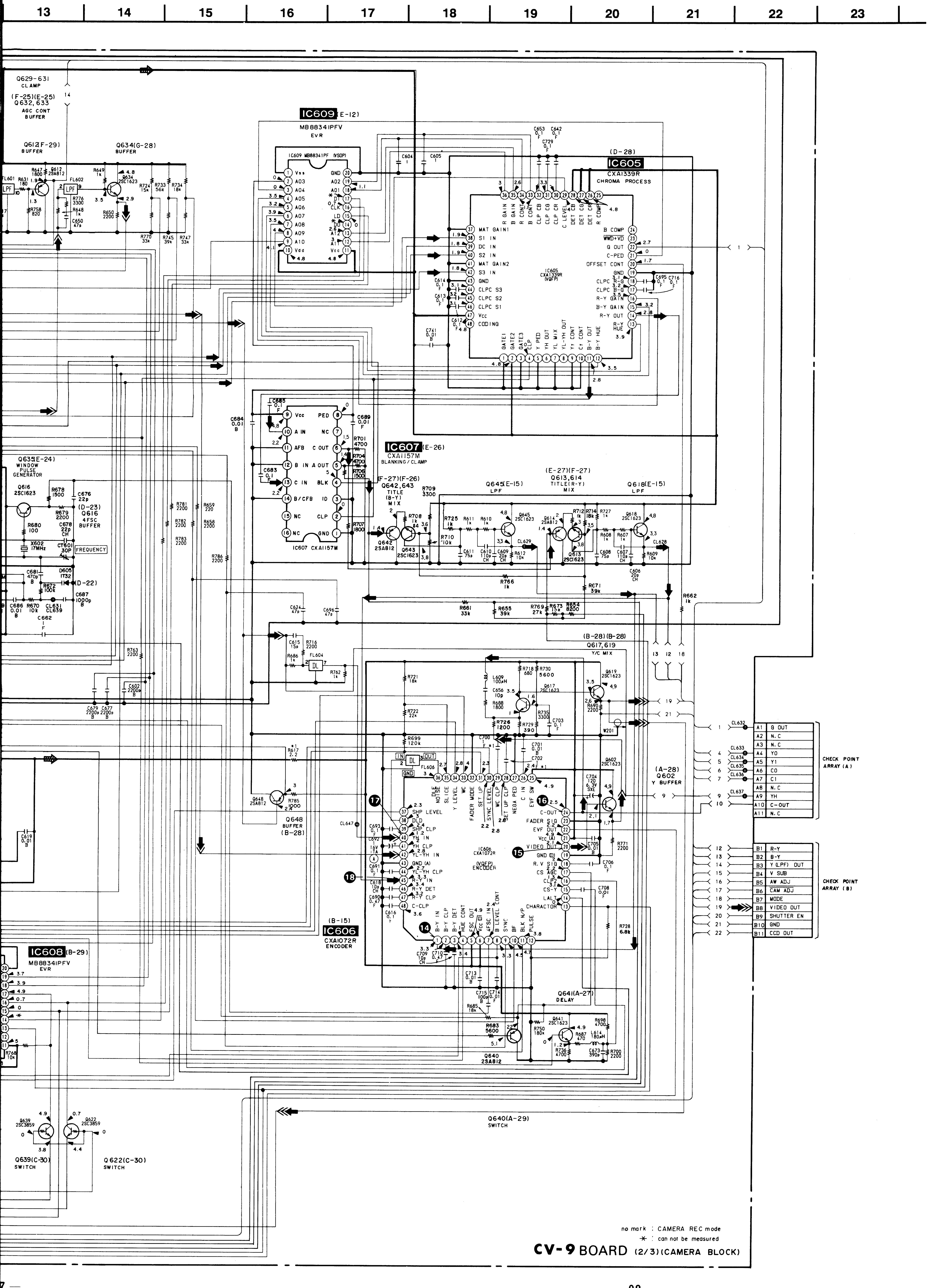
16
Q603(G-25) AGC SWITCH
(G-24)(G-24) Q646,647 AGC DET
Q620(H-23) Q626(G-23) Q627(H-23) Q628(G-23) AGC DEF
Q629-631 CLAMP
(F-25)(E-25) Q632,633 AGC CONT BUFFER
Q612(F-29) BUFFER
Q634(G-28) BUFFER
IC609 (E-12) MB88341PFV EVR
HIC601 DT-79
HIC602 MX-7
DT-79D: AEP(TYPE1),E Australian MODEL
DT-79A: AEP(TYPE2),UK MODEL
DT-79 BOARD
MX-7 BOARD
IC607 CXA1157M
Q635(E-24) WINDOW PULSE GENERATOR
Q616 2SC1623
(D-23) Q616 4FSC BUFFER
X602 17MHz
CT601 30P FREQUENCY
(D-24) Q615 BUFFER
(E-23) IC604 CXD1159Q SYNC GEN
(B-31)(C-31) Q625,638 HIGH LUMI. DET BLANKING
(A-31)(B-31)(A-31) Q621,623,624 BLK
D606 1S2837(H-26)
IC610 (A-9) S8054ALB SYSTEM RESET
X601 4MHz
IC601 (B-32) MC68HC05N4 EVR/WB μCON
(B-10) IC602 MC14066BF SWITCH
IC603 (B-30) μPC324G2
⑤⑥⑦ CURRENT SORCE
⑧⑨⑩ DC OUT BUFFER
⑫⑬⑭ TRIANGLE WAVEFORMER
①②③ AW COMPARATOR
Q608(B-30) CURRENT SORCE
IC608 (B-29) MB88341PFV EVR
Q639(C-30) SWITCH
Q622(C-30) SWITCH
Q648 BUFFER (B-28)
(B-15) IC606 CXA1072R ENCODER


13
14
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16
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18
19
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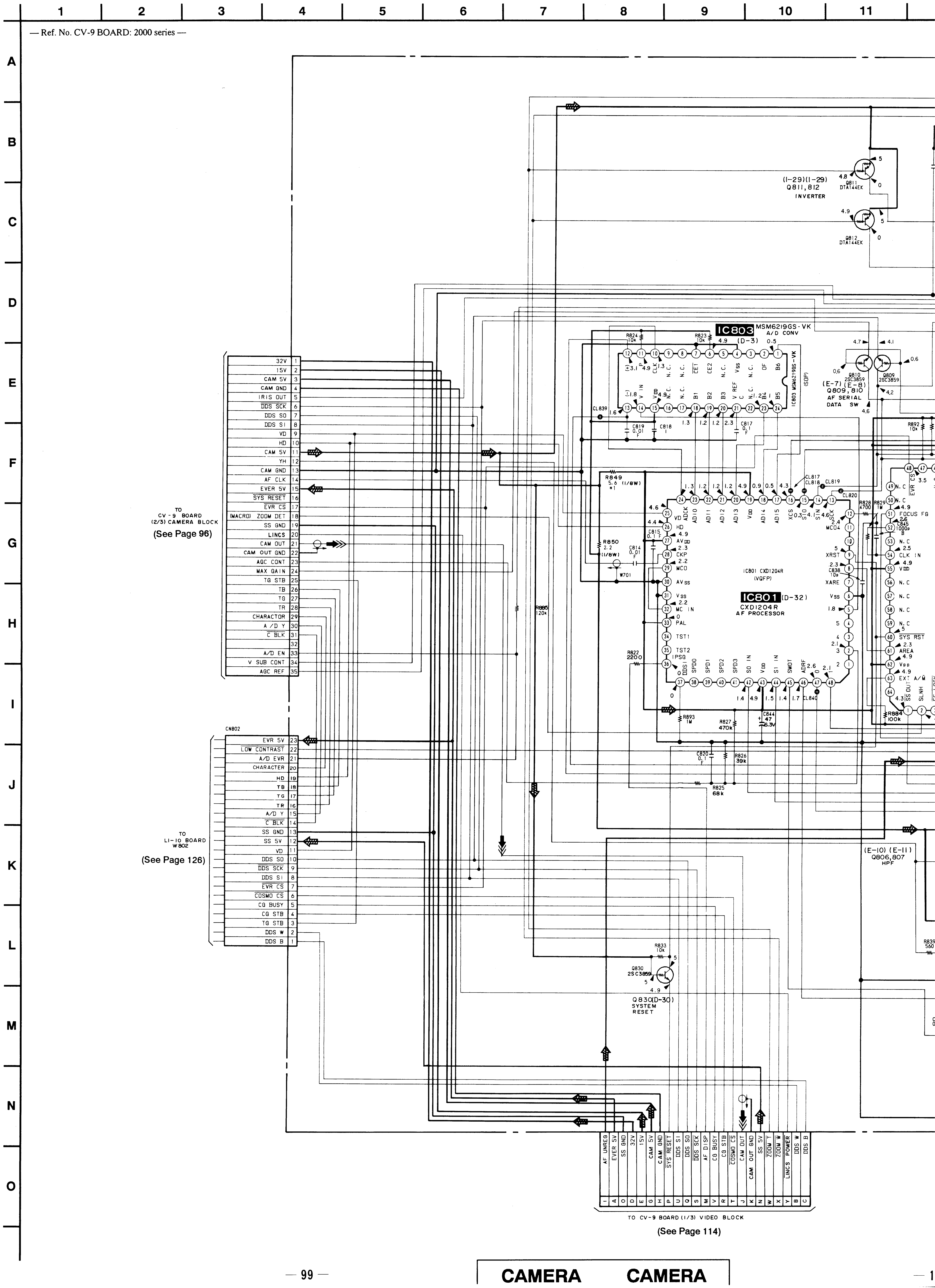
21
22
23
Q629-631 CLAMP
(F-25)(E-25) Q632,633 AGC CONT BUFFER
Q612(F-29) BUFFER
Q634(G-28) BUFFER
IC609 (E-12)
MB88341PFV
EVR
IC609 MB88341PF (VSOP)
(D-28)
IC605
CXA1339R
CHROMA PROCESS
IC605 CXA1339R (VQFP)
IC607 (E-26)
CXA1157M
BLANKING/CLAMP
IC607 CXA1157M
Q635(E-24) WINDOW PULSE GENERATOR
Q616 2SC1623
(D-23) Q616 4FSC BUFFER
X602 17MHz
FREQUENCY
D605 1T32
(D-22)
(F-27)(F-26) Q642,643 TITLE (B-Y) MIX
Q645(E-15) LPF
(E-27)(F-27) Q613,614 TITLE(R-Y) MIX
Q618(E-15) LPF
(B-28)(B-28) Q617,619 Y/C MIX
Q648 BUFFER (B-28)
IC606 CXA1072R (VQFP) ENCODER
(B-15)
IC606
CXA1072R
ENCODER
(A-28) Q602 Y BUFFER
IC608 (B-29)
MB88341PFV
EVR
Q641(A-27) DELAY
Q640 2SA812
Q640(A-29) SWITCH
Q639(C-30) SWITCH
Q622(C-30) SWITCH
A1 G OUT
A2 N.C
A3 N.C
A4 YO
A5 Y1
A6 CO
A7 C1
A8 N.C
A9 YH
A10 C-OUT
A11 N.C
CHECK POINT ARRAY (A)
B1 R-Y
B2 B-Y
B3 Y (LPF) OUT
B4 V SUB
B5 AW ADJ
B6 CAM ADJ
B7 MODE
B8 VIDEO OUT
B9 SHUTTER EN
B10 GND
B11 CCD OUT
CHECK POINT ARRAY (B)
14
15
16
17
18

no mark : CAMERA REC mode
＊ : can not be measured

CV-9 BOARD (2/3)(CAMERA BLOCK)

CV-9 (CAMERA) SCHEMATIC DIAGRAMS

— Ref. No. CV-9 BOARD: 2000 series —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B
C
D
E
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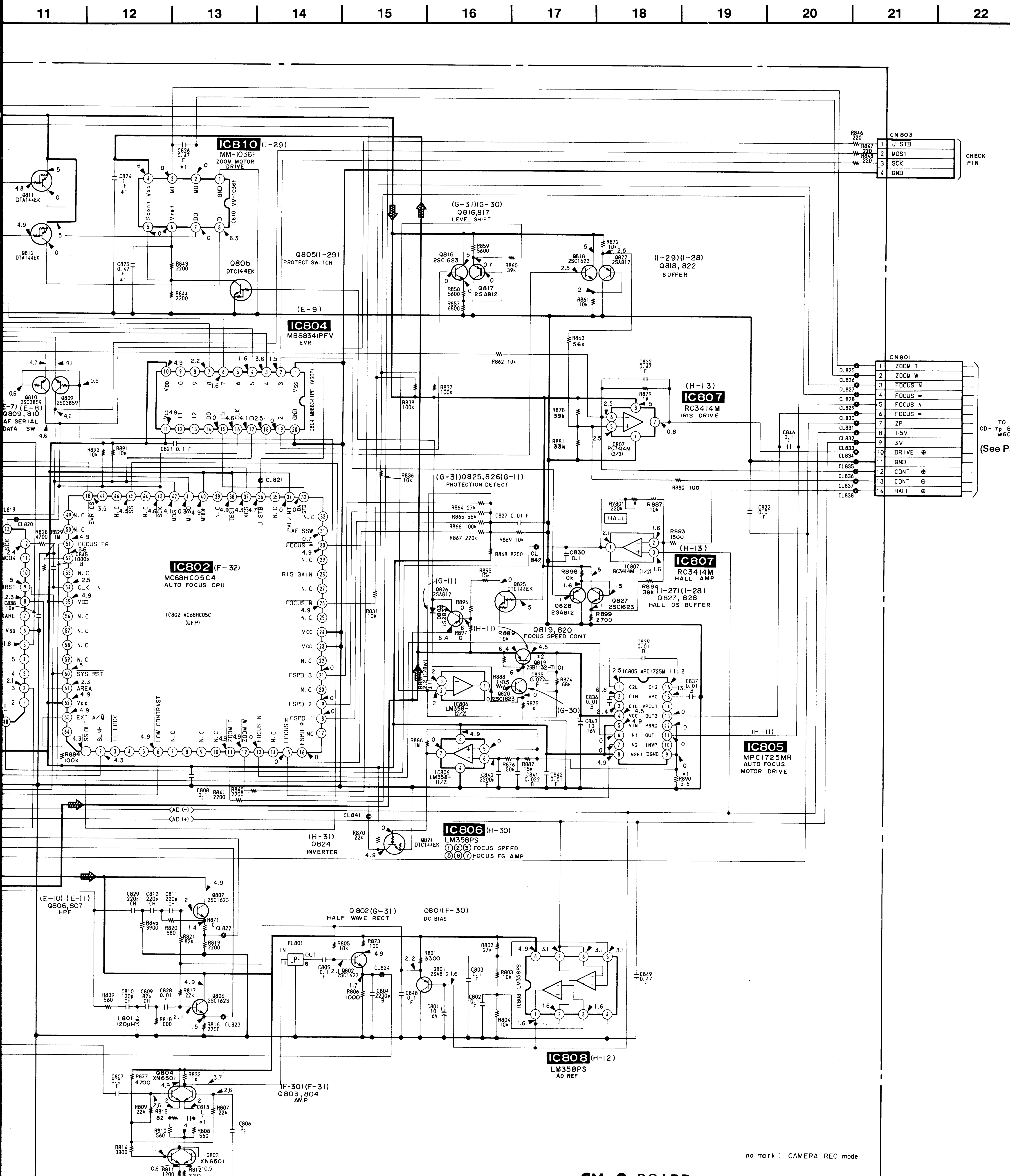
G
H
I
J
K
L
M
N
O
TO CV-9 BOARD (2/3) CAMERA BLOCK
(See Page 96)
32V 1
15V 2
CAM 5V 3
CAM GND 4
IRIS OUT 5
DDS SCK 6
DDS SO 7
DDS SI 8
VD 9
HD 10
CAM 5V 11
YH 12
CAM GND 13
AF CLK 14
EVER 5V 15
SYS RESET 16
EVR CS 17
(MACRO) ZOOM DET 18
SS GND 19
LINCS 20
CAM OUT 21
CAM OUT GND 22
AGC CONT 23
MAX GAIN 24
TG STB 25
TB 26
TG 27
TR 28
CHARACTOR 29
A/D Y 30
C BLK 31
32
A/D EN 33
V SUB CONT 34
AGC REF 35
CN802
TO LI-10 BOARD W802
(See Page 126)
EVR 5V 23
LOW CONTRAST 22
A/D EVR 21
CHARACTER 20
HD 19
TB 18
TG 17
TR 16
A/D Y 15
C BLK 14
SS GND 13
SS 5V 12
VD 11
DDS SO 10
DDS SCK 9
DDS SI 8
EVR CS 7
COSMO CS 6
CG BUSY 5
CG STB 4
TG STB 3
DDS W 2
DDS B 1
(I-29)(I-29) Q811,812 INVERTER
Q811 DTA144EK
Q812 DTA144EK
IC803 MSM6219GS-VK A/D CONV (D-3)
Q810 2SC3859
Q809 2SC3859
(E-7) (E-8) Q809,810 AF SERIAL DATA SW
R824 10k
R823 10k
C819 0.01 F
C818 1
C817 0.1 F
CL839
CL817 CL818
CL819
CL820
R849 5.6 (1/8W) *1
R850 2.2 (1/8W)
C814 0.01 F
C815 0.1 F
W701
IC801 CXD1204R (VQFP)
IC801 (D-32)
CXD1204R AF PROCESSOR
R828 4700
R829 1M
C845 1000p B
C838 10p
R892 10k
R885 120k
R822 2200
R893 1M
R827 470k
C844 47 6.3V
CL840
R884 100k
C820 0.1 F
R826 39k
R825 68k
(E-10) (E-11) Q806,807 HPF
R839 560
R833 10k
Q830 2SC3859
Q830(D-30) SYSTEM RESET
AF UNREG
EVER 5V
SS GND
32V
15V
CAM GND
SYS RESET
DDS SI
DDS SO
DDS SCK
AF DISP
CG STB
COSMO CS
CAM OUT
CAM OUT GND
SS 5V
ZOOM T
ZOOM W
LINCS POWER
DDS W
DDS B
TO CV-9 BOARD (1/3) VIDEO BLOCK
(See Page 114)


11
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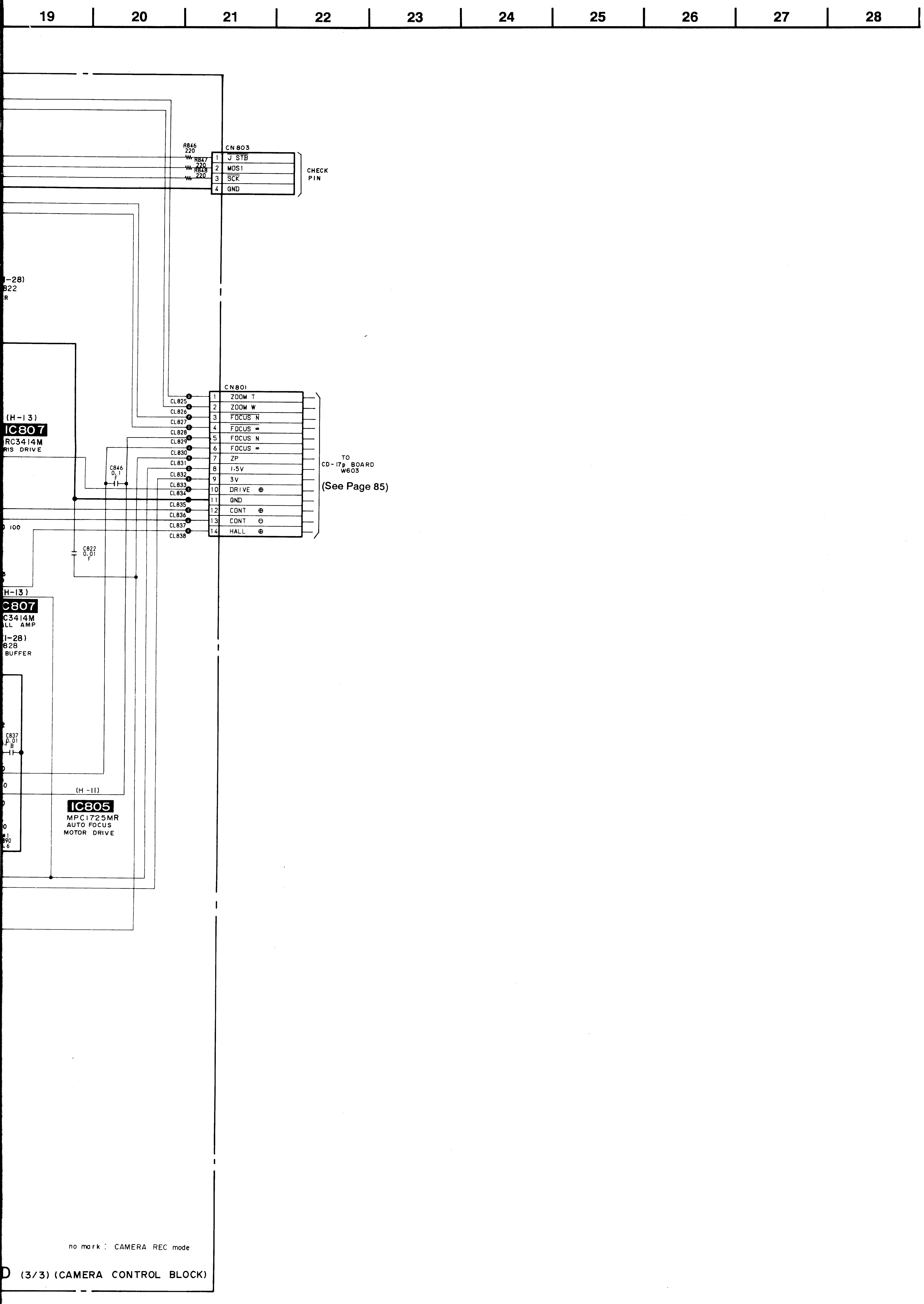
22
IC810 (I-29)
MM-1036F
ZOOM MOTOR DRIVE
Q811 DTA144EK
Q812 DTA144EK
Q805 DTC144EK
Q805(I-29) PROTECT SWITCH
(G-31)(G-30) Q816,817 LEVEL SHIFT
Q816 2SC1623
Q817 2SA812
Q818 2SC1623
Q822 2SA812
(I-29)(I-28) Q818, 822 BUFFER
CN803
1 J STB
2 MOS1
3 SCK
4 GND
CHECK PIN
(E-9)
IC804
MB88341PFV
EVR
Q810 2SC3859
Q809 2SC3859
(E-7) (E-8) Q809, 810 AF SERIAL DATA SW
(H-13) IC807 RC3414M IRIS DRIVE
CN801
1 ZOOM T
2 ZOOM W
3 FOCUS N
4 FOCUS ⊕
5 FOCUS N
6 FOCUS ⊖
7 ZP
8 1.5V
9 3V
10 DRIVE ⊕
11 GND
12 CONT ⊕
13 CONT ⊖
14 HALL ⊕
TO CD-17p
(See P
IC802 (F-32)
MC68HC05C4
AUTO FOCUS CPU
IC802 MC68HC05C (QFP)
(G-31)Q825,826(G-11) PROTECTION DETECT
(H-13) IC807 RC3414M HALL AMP
(I-27)(I-28) Q827, 828 HALL OS BUFFER
Q828 2SA812
Q827 2SC1623
Q825 DTC144EK
Q826 2SA812
Q819,820 FOCUS SPEED CONT
Q819 2SB1132-T1 01
Q820 2SC1623
IC806 LM358 (2/2)
IC806 LM358 (1/2)
IC805 MPC1725M
(H-11) IC805 MPC1725MR AUTO FOCUS MOTOR DRIVE
(H-31) Q824 INVERTER
Q824 DTC144EK
IC806 (H-30) LM358PS
①②③ FOCUS SPEED
⑤⑥⑦ FOCUS FG AMP
(E-10) (E-11) Q806,807 HPF
Q807 2SC1623
Q806 2SC1623
Q802 (G-31) HALF WAVE RECT
Q801 (F-30) DC BIAS
Q802 2SC1623
Q801 2SA812
FL801 LPF
L801 120μH
IC808 (H-12) LM358PS AD REF
Q804 XN6501
Q803 XN6501
(F-30)(F-31) Q803,804 AMP
HALL
(AD (-))
(AD (+))

no mark : CAMERA REC mode

CV-9 BOARD (3/3) (CAMERA CONTROL BLOCK)

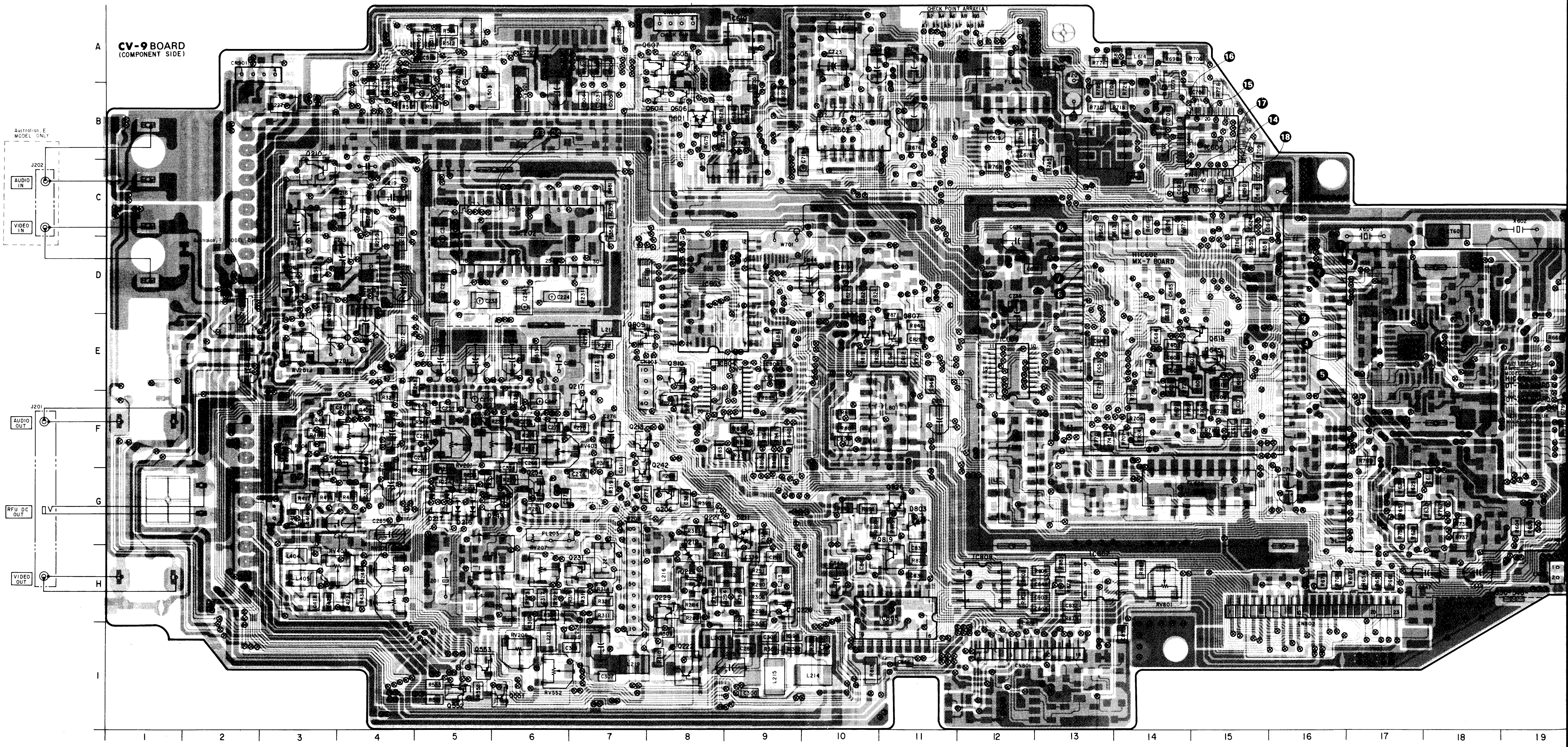

19
20
21
22
23
24
25
26
27
28
R846 220
R847 220
R848 220
CN803
1 J STB
2 MOS1
3 SCK
4 GND
CHECK PIN
-28)
822
R
CN801
1 ZOOM T
2 ZOOM W
3 FOCUS N
4 FOCUS ⊖
5 FOCUS N
6 FOCUS ⊖
7 ZP
8 1.5V
9 3V
10 DRIVE ⊕
11 GND
12 CONT ⊕
13 CONT ⊖
14 HALL ⊕
CL825
CL826
CL827
CL828
CL829
CL830
CL831
CL832
CL833
CL834
CL835
CL836
CL837
CL838
TO CD-17p BOARD W603
(See Page 85)
(H-13)
IC807
RC3414M
IRIS DRIVE
C846 0.1 F
100
C822 0.01 F
(H-13)
IC807
C3414M
HALL AMP
(I-28)
828
BUFFER
C837 0.01 B
(H-11)
IC805
MPC1725MR
AUTO FOCUS
MOTOR DRIVE
no mark : CAMERA REC mode
(3/3) (CAMERA CONTROL BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC			➡	
PB				

CV-9 (CAMERA, VIDEO PROCESS) PRINTED WIRING BOARDS

— Ref. No. CV-9 BOARD: 2000 series —


CV-9 BOARD
(COMPONENT SIDE)
Australian, E MODEL ONLY
J202
AUDIO IN
VIDEO IN
J201
AUDIO OUT
RFU DC OUT
VIDEO OUT
CHECK POINT ARRAY(A)
MX-7 BOARD
CN801
CN802
A
B
C
D
E
F
G
H
I
1
2
3
4
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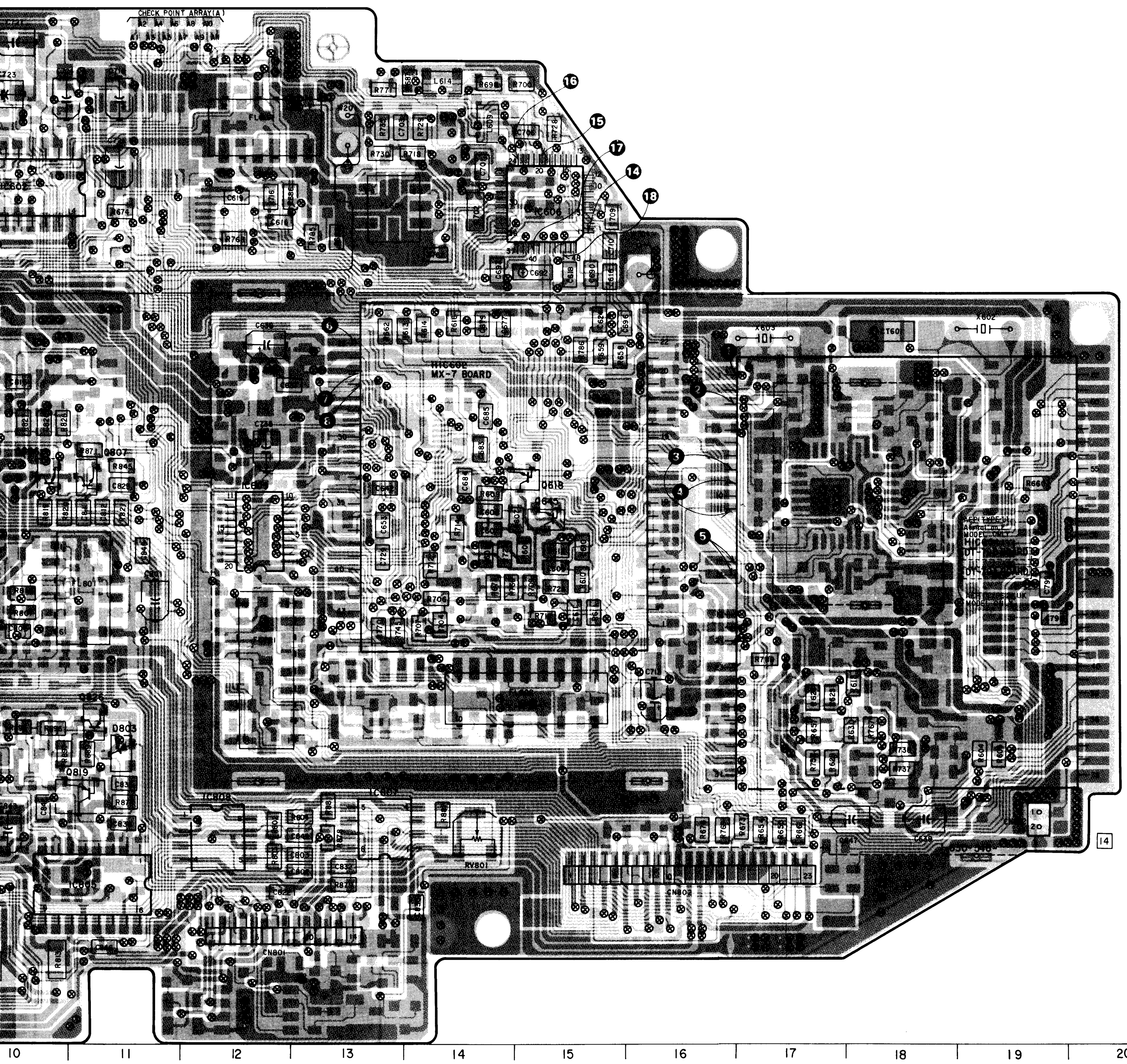
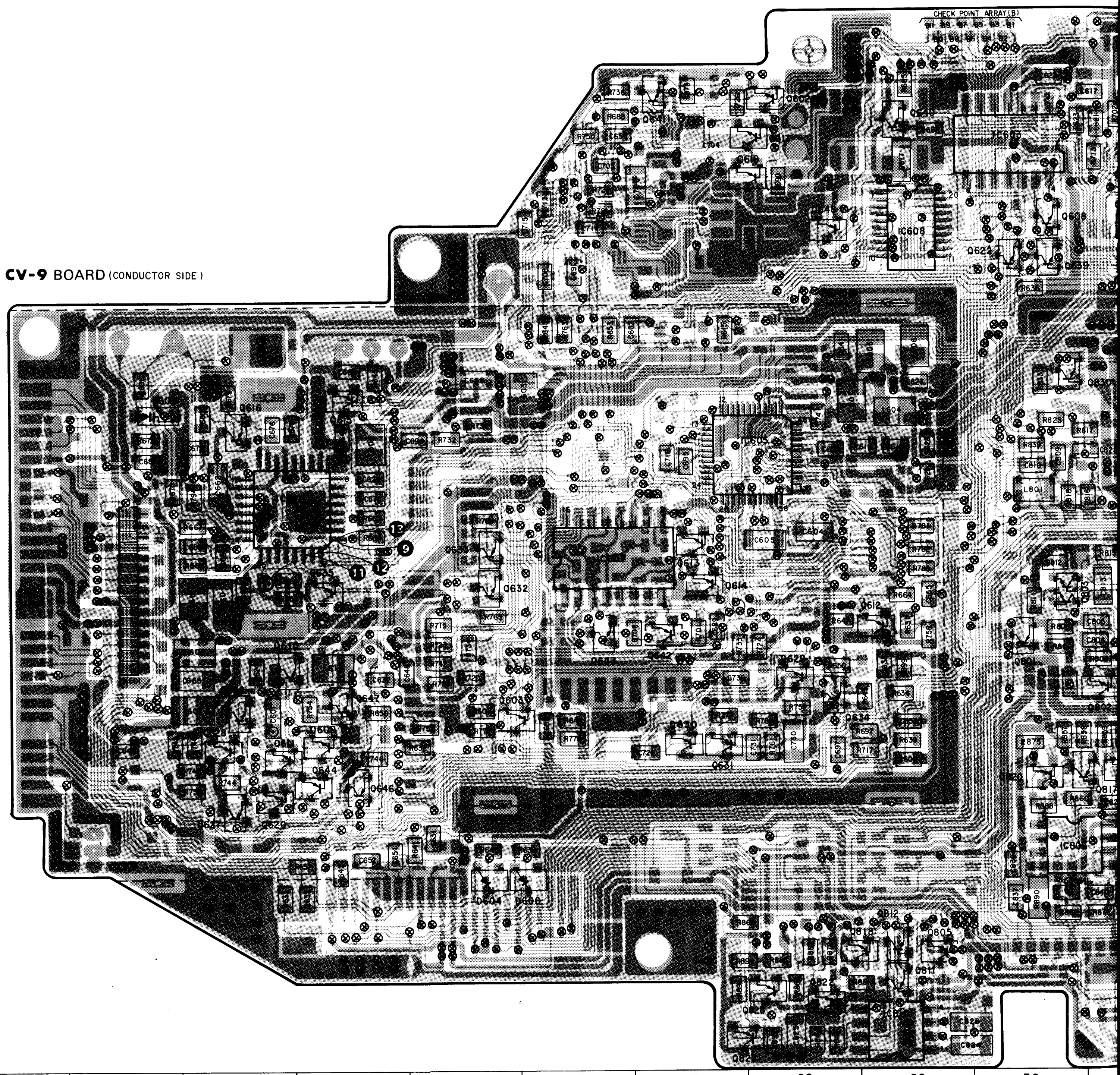
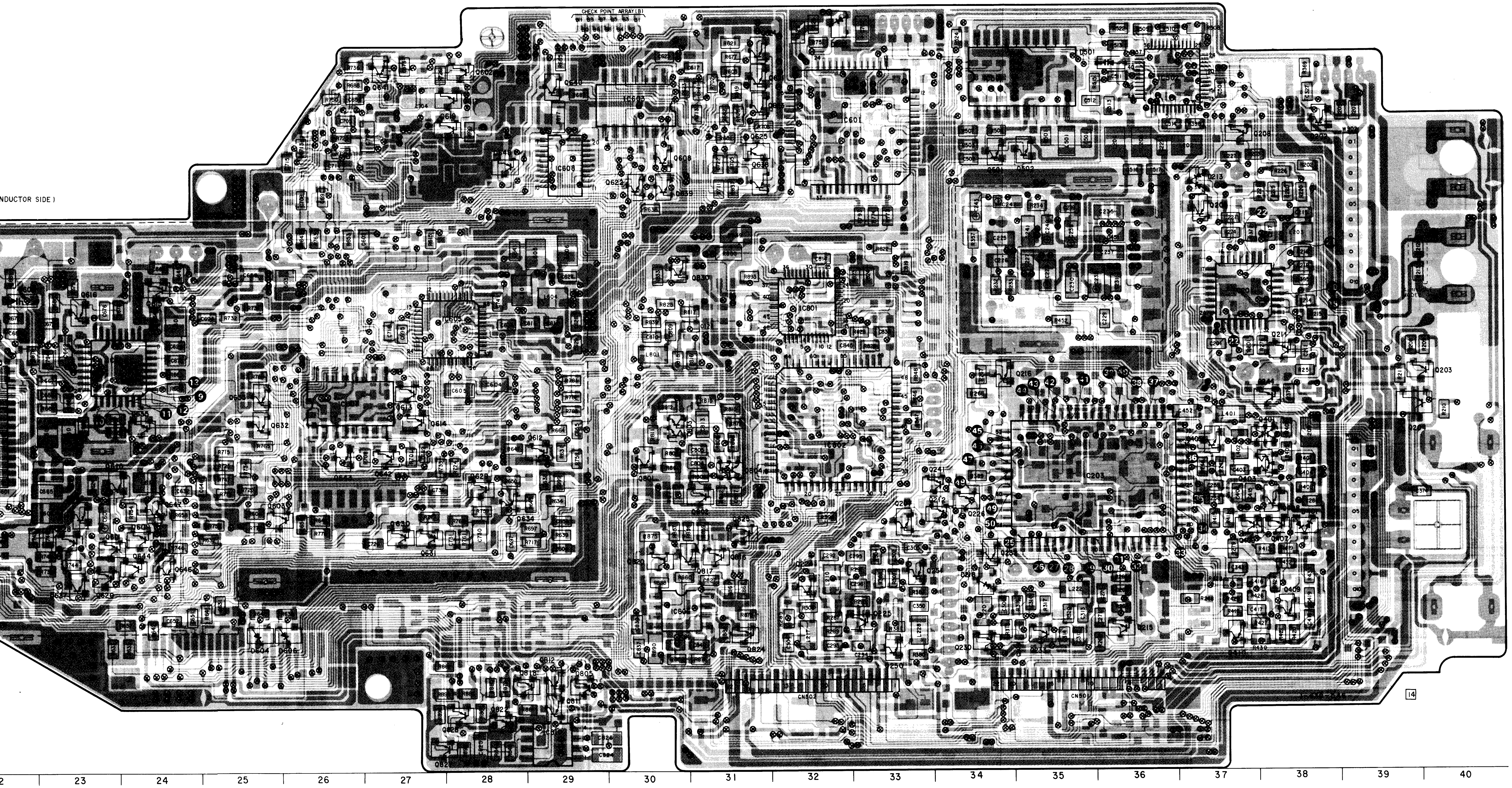

CHECK POINT ARRAY(A)
MX-7 BOARD
X603
X602
CN803
CN801
RV801
IC608
Q618
⑭
⑮
⑯
⑰
⑱
③
④
⑤

CV-9 BOARD (CONDUCTOR SIDE)


CHECK POINT ARRAY(B)
IC608
IC603
IC602
Q616
Q632
Q613
Q614
⑨
⑪
⑫
⑬

10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30

NDUCTOR SIDE)


CHECK POINT ARRAY (B)
IC601
IC603
IC605
IC608
IC801
IC203
CN502
CN501
Q203
14
2
23
24
25
26
27
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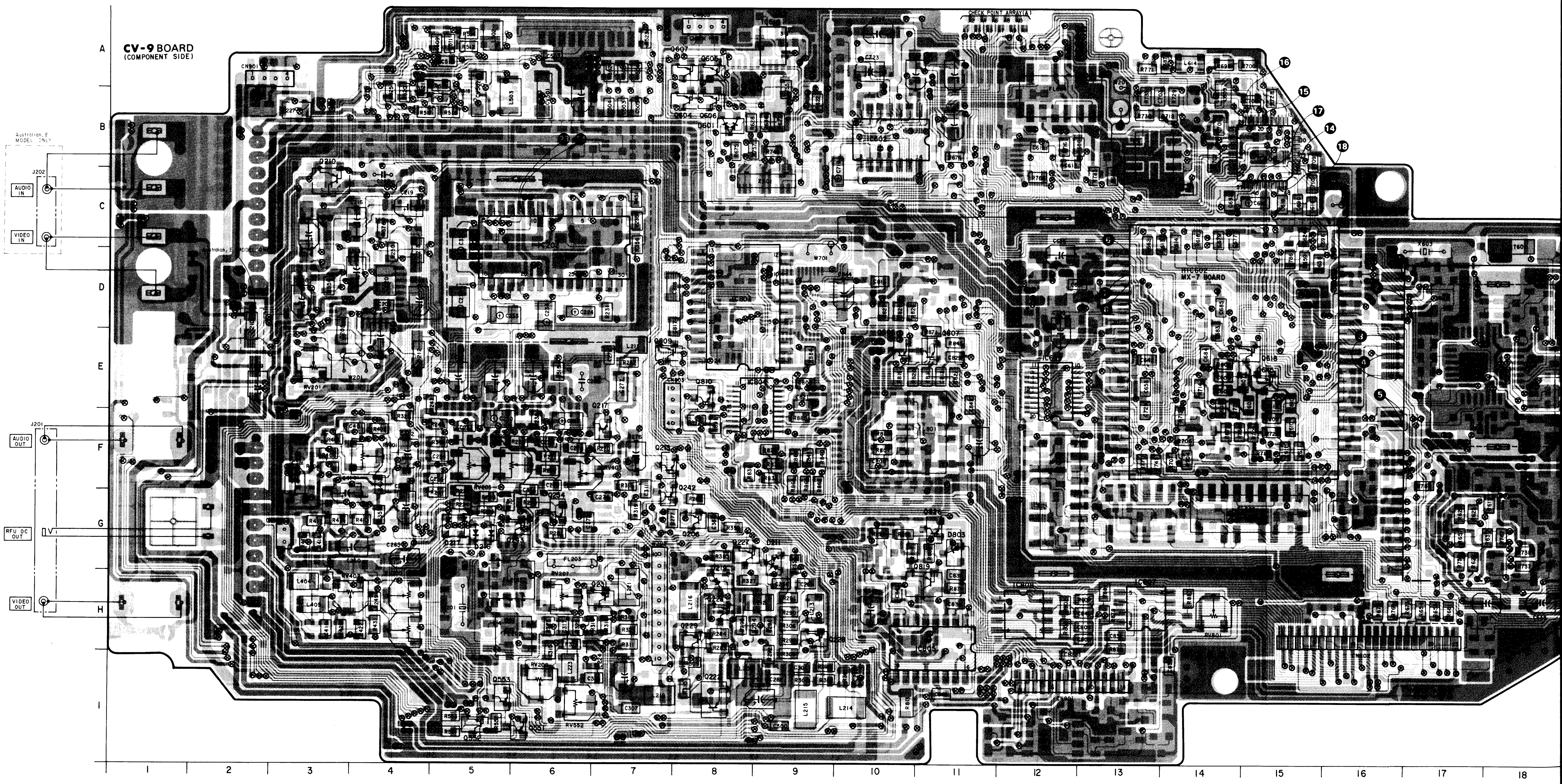
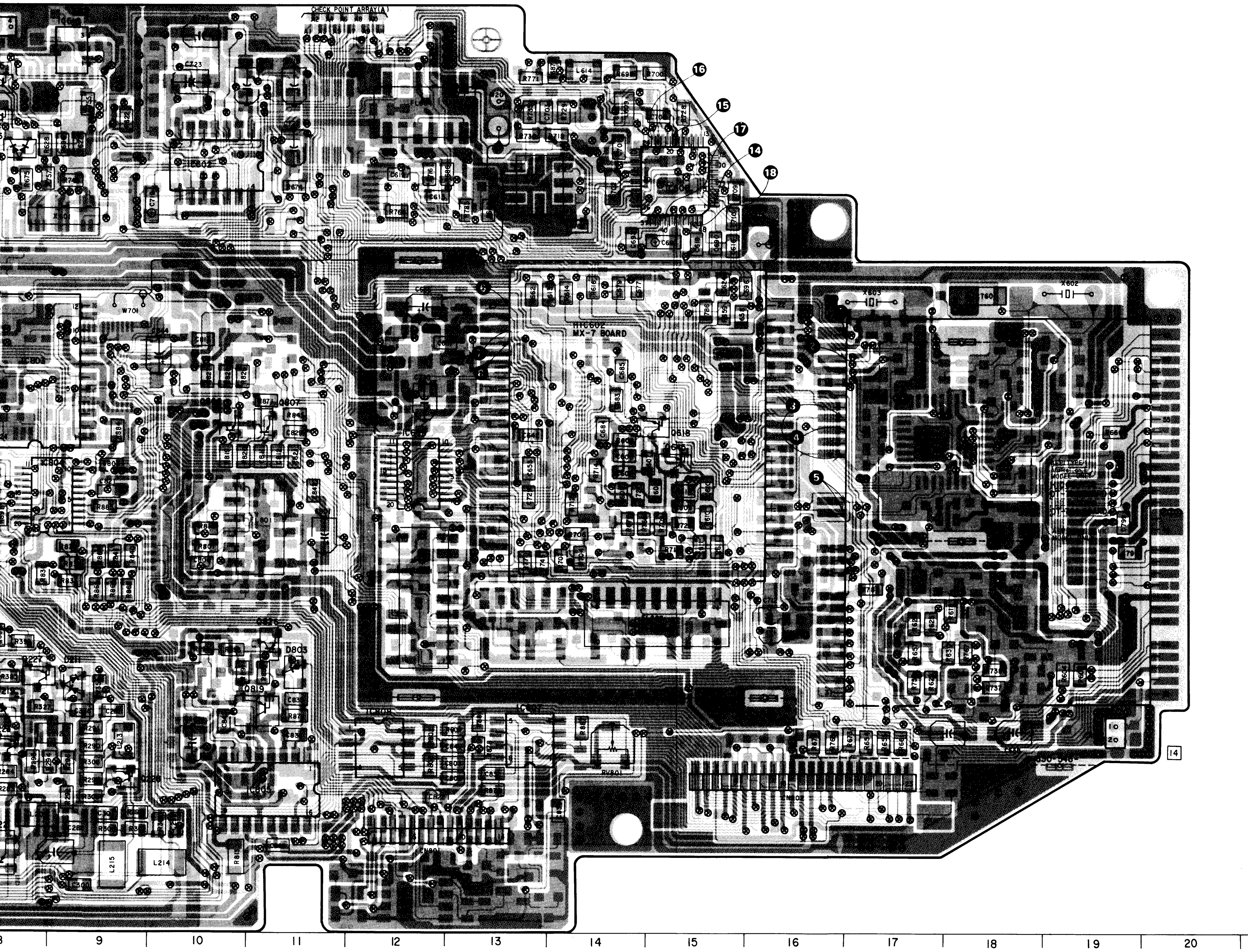
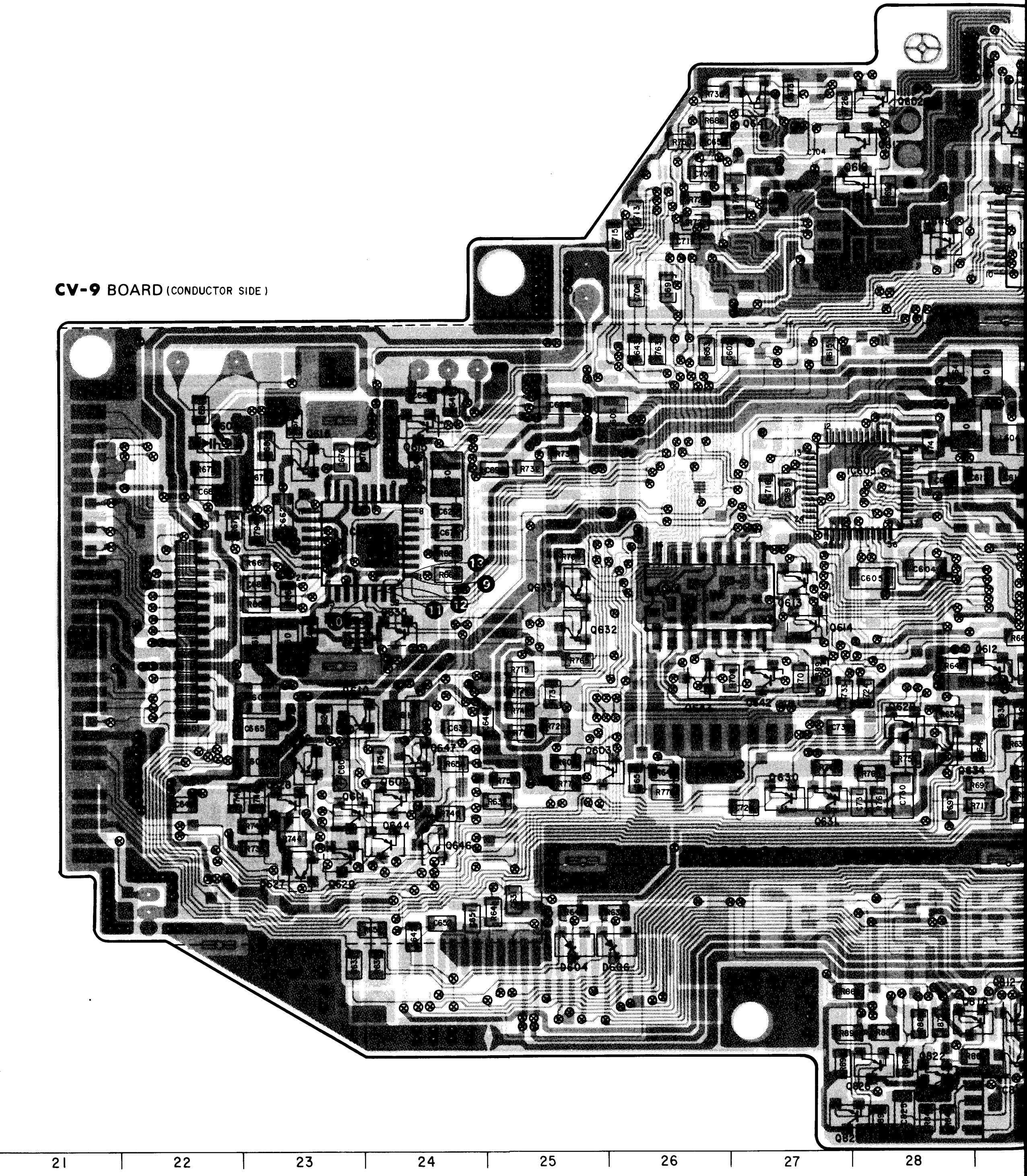
CV-9 (CAMERA, VIDEO PROCESS) PRINTED WIRING BOARDS

— Ref. No. CV-9 BOARD: 2000 series —


CV-9 BOARD
(COMPONENT SIDE)
Australian, E MODEL ONLY
J202
AUDIO IN
VIDEO IN
J201
AUDIO OUT
RFU DC OUT
VIDEO OUT
CN901
CHECK POINT ARRAY(A)
HIC6602 MX-7 BOARD
⑭
⑮
⑯
⑰
⑱
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18


CHECK POINT ARRAY(A)
MX-7 BOARD
16
15
17
14
18
14
8
9
10
11
12
13
14
15
16
17
18
19
20

CV-9 BOARD (CONDUCTOR SIDE)


21
22
23
24
25
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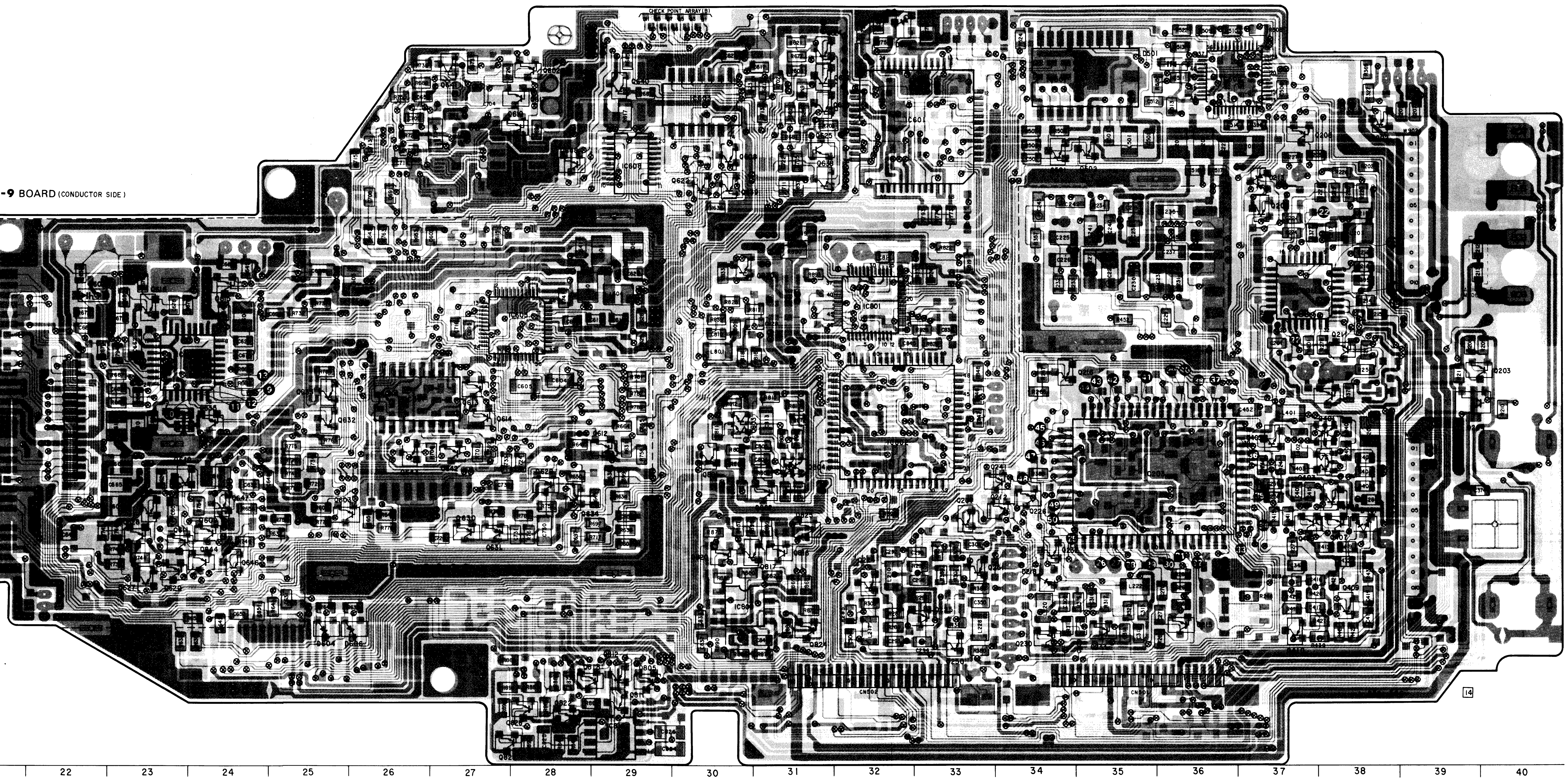
27
28

-9 BOARD (CONDUCTOR SIDE)


CHECK POINT ARRAY (B)
IC601
IC605
IC801
IC603
CN502
CN501
14
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
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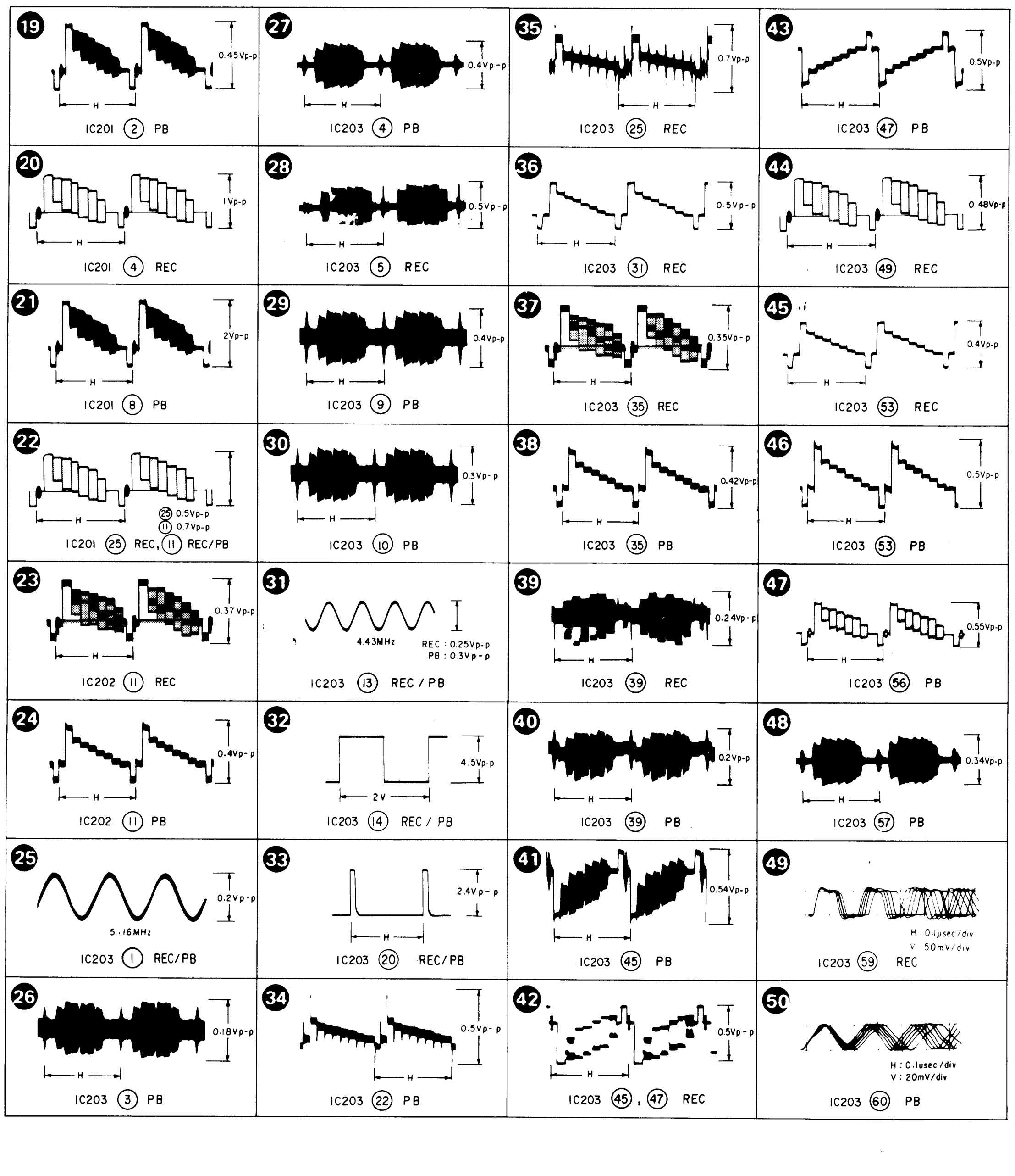
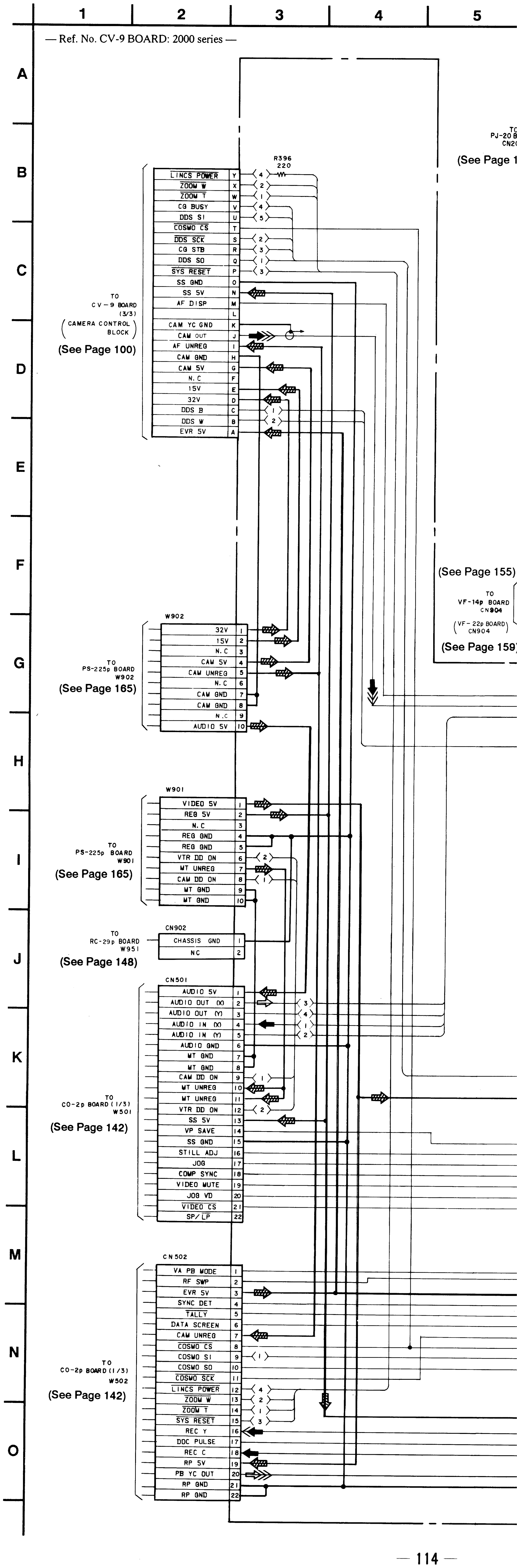
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	➡»	➡⋙	➡
PB	⇨	⇨»	⇨⋙	⇨

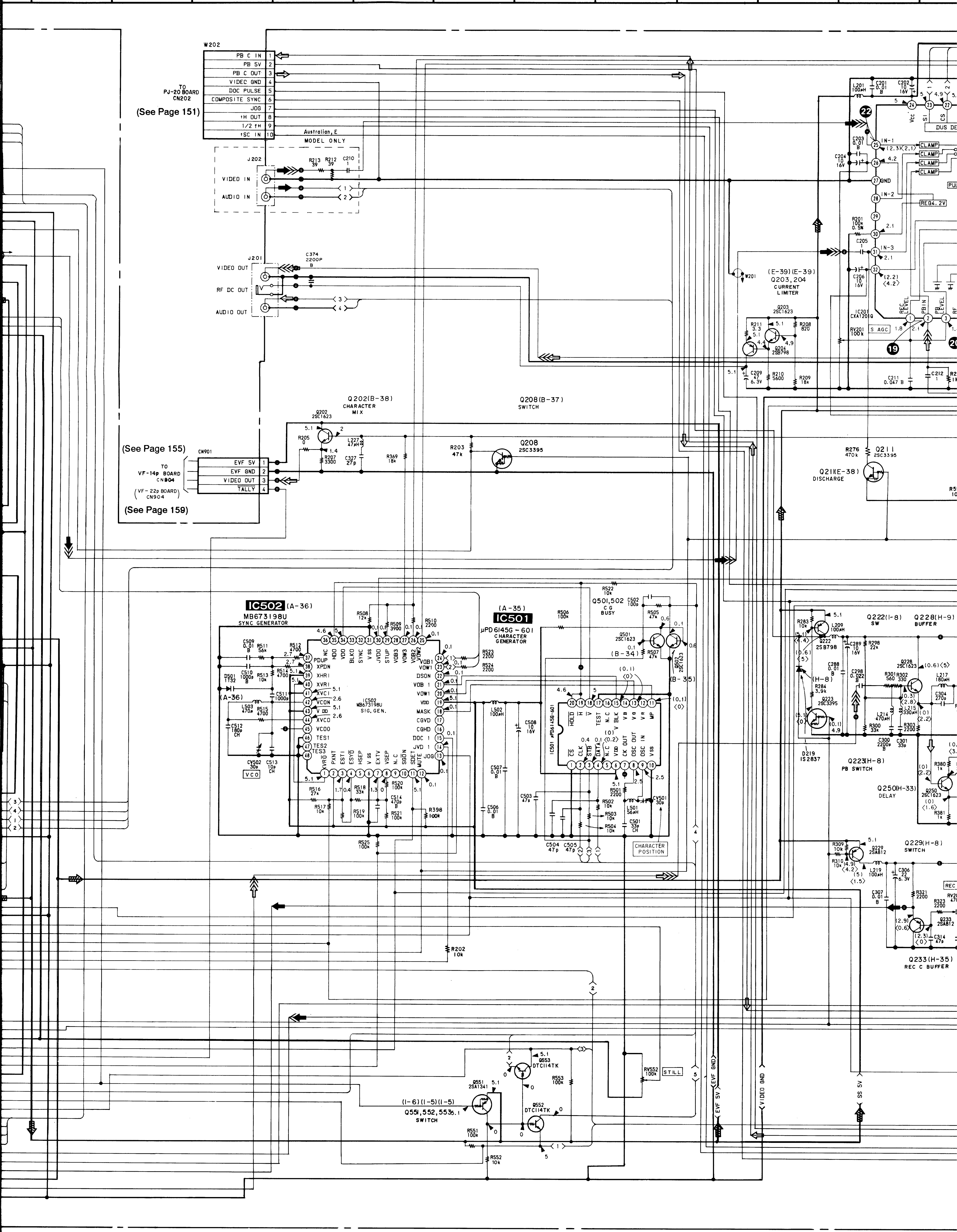
CV-9 BOARD (VIDEO)

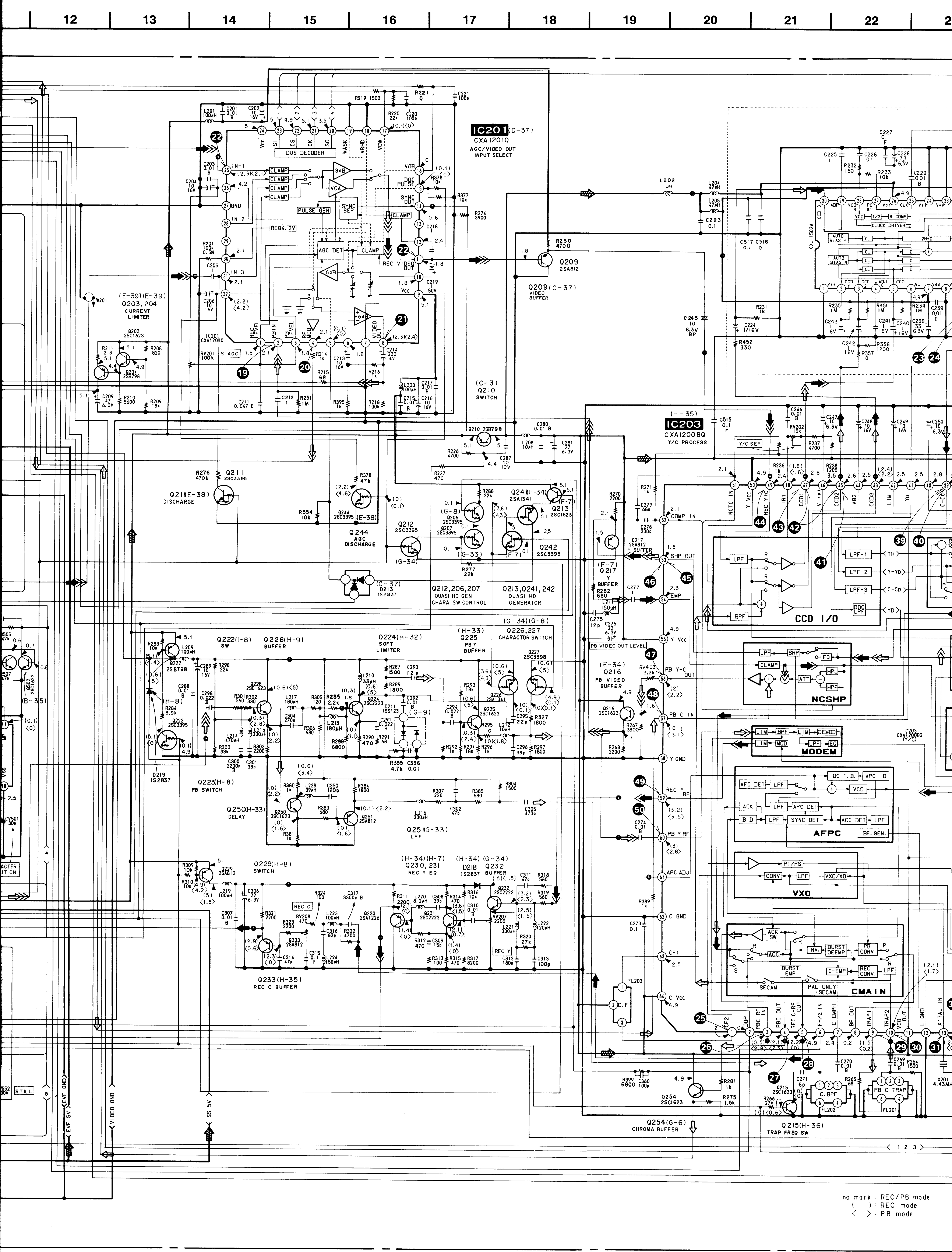


CV-9 (VIDEO PROCESS) SCHEMATIC DIAGRAMS

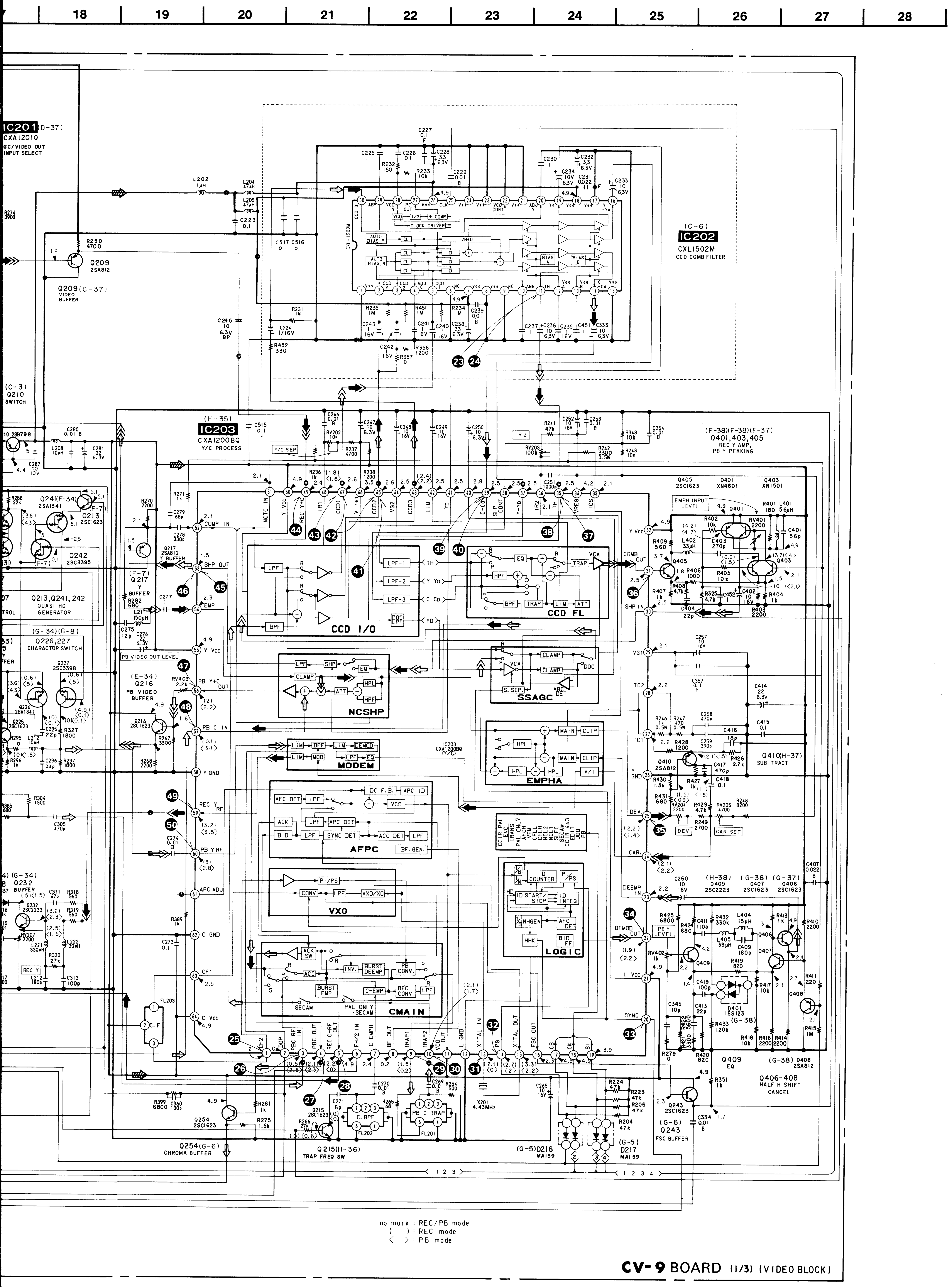


1
2
3
4
5
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
— Ref. No. CV-9 BOARD: 2000 series —
R396 220
TO CV-9 BOARD (3/3) (CAMERA CONTROL BLOCK)
(See Page 100)
LINCS POWER Y
ZOOM W X
ZOOM T W
CG BUSY V
DDS SI U
COSMO CS T
DDS SCK S
CG STB R
DDS SO Q
SYS RESET P
SS GND O
SS 5V N
AF DISP M
L
CAM YC GND K
CAM OUT J
AF UNREG I
CAM GND H
CAM 5V G
N.C F
15V E
32V D
DDS B C
DDS W B
EVR 5V A
TO PJ-20 B CN20
(See Page 1
(See Page 155)
TO VF-14p BOARD CN904
(VF-22p BOARD CN904)
(See Page 159)
W902
TO PS-225p BOARD W902
(See Page 165)
32V 1
15V 2
N.C 3
CAM 5V 4
CAM UNREG 5
N.C 6
CAM GND 7
CAM GND 8
N.C 9
AUDIO 5V 10
W901
TO PS-225p BOARD W901
(See Page 165)
VIDEO 5V 1
REG 5V 2
N.C 3
REG GND 4
REG GND 5
VTR DD ON 6
MT UNREG 7
CAM DD ON 8
MT GND 9
MT GND 10
CN902
TO RC-29p BOARD W951
(See Page 148)
CHASSIS GND 1
NC 2
CN501
TO CO-2p BOARD (1/3) W501
(See Page 142)
AUDIO 5V 1
AUDIO OUT (X) 2
AUDIO OUT (Y) 3
AUDIO IN (X) 4
AUDIO IN (Y) 5
AUDIO GND 6
MT GND 7
MT GND 8
CAM DD ON 9
MT UNREG 10
MT UNREG 11
VTR DD ON 12
SS 5V 13
VP SAVE 14
SS GND 15
STILL ADJ 16
JOG 17
COMP SYNC 18
VIDEO MUTE 19
JOG VD 20
VIDEO CS 21
SP/LP 22
CN502
TO CO-2p BOARD (1/3) W502
(See Page 142)
VA PB MODE 1
RF SWP 2
EVR 5V 3
SYNC DET 4
TALLY 5
DATA SCREEN 6
CAM UNREG 7
COSMO CS 8
COSMO SI 9
COSMO SO 10
COSMO SCK 11
LINCS POWER 12
ZOOM W 13
ZOOM T 14
SYS RESET 15
REC Y 16
DOC PULSE 17
REC C 18
RP 5V 19
PB YC OUT 20
RP GND 21
RP GND 22


W202
PB C IN
PB 5V
PB C OUT
VIDEO GND
DOC PULSE
COMPOSITE SYNC
JOG
fH OUT
1/2 fH
fSC IN
TO PJ-20 BOARD CN202
(See Page 151)
Australian, E MODEL ONLY
J202
VIDEO IN
AUDIO IN
J201
VIDEO OUT
RF DC OUT
AUDIO OUT
Q202(B-38) CHARACTER MIX
Q208(B-37) SWITCH
Q208 2SC3395
(See Page 155)
CN901
EVF 5V
EVF GND
VIDEO OUT
TALLY
TO VF-14p BOARD CN904
(VF-22p BOARD) CN904
(See Page 159)
IC502 (A-36)
MB673198U SYNC GENERATOR
IC502 MB673198U SIG. GEN.
VCO
(A-35) IC501
μPD6145G-601 CHARACTER GENERATOR
Q501,502 CG BUSY
CHARACTER POSITION
Q221(E-38) DISCHARGE
Q211 2SC3395
(E-39)(E-39) Q203,204 CURRENT LIMITER
IC201 CXA1201Q
S AGC
CLAMP
REG4.2V
DUS DE
Q222(I-8) SW
Q228(H-9) BUFFER
Q223(H-8) PB SWITCH
D219 1S2837
Q250(H-33) DELAY
Q229(H-8) SWITCH
Q233(H-35) REC C BUFFER
(I-6)(I-5)(I-5) Q551,552,553 SWITCH
Q553 DTC114TK
Q552 DTC114TK
Q551 2SA1341
RV552 100k
STILL
EVF 5V
EVF GND
VIDEO GND
SS 5V
⑲
㉒


12
13
14
15
16
17
18
19
20
21
22
IC201 (D-37)
CXA1201Q
AGC/VIDEO OUT
INPUT SELECT
DUS DECODER
CLAMP
3dB
VCA
PULSE GEN
SYNC SEP
AGC DET
REC VIDEO OUT
6dB
REG4.2V
S AGC
(E-39)(E-39)
Q203,204
CURRENT LIMITER
Q209 (C-37)
VIDEO BUFFER
Q209
2SA812
(C-3)
Q210
SWITCH
Q211 (E-38)
DISCHARGE
Q244
AGC DISCHARGE
Q212,206,207
QUASI HD GEN
CHARA SW CONTROL
Q213,Q241,242
QUASI HD GENERATOR
D213
1S2837
IC203 (F-35)
CXA1200BQ
Y/C PROCESS
Y/C SEP
CCD I/O
LPF-1
LPF-2
LPF-3
BPF
NCSHP
MODEM
AFPC
VXO
CMAIN
(F-7)
Q217
Y BUFFER
(E-34)
Q216
PB VIDEO BUFFER
PB VIDEO OUT LEVEL
Q222(I-8)
SW
Q228(H-9)
BUFFER
Q224(H-32)
SOFT LIMITER
(H-33)
Q225
PB Y BUFFER
(G-34)(G-8)
Q226,227
CHARACTOR SWITCH
Q223(H-8)
PB SWITCH
D219
1S2837
Q250(H-33)
DELAY
Q251(G-33)
LPF
Q229(H-8)
SWITCH
(H-34)(H-7)
Q230,231
REC Y EQ
(H-34)(G-34)
D218 Q232
1S2837 BUFFER
Q233(H-35)
REC C BUFFER
Q254(G-6)
CHROMA BUFFER
Q215(H-36)
TRAP FREQ SW
FL203
C.F
C.BPF
FL202
PB C TRAP
FL201
X201
4.43MHz
CXL-1502M
CCD 3
AUTO BIAS P
AUTO BIAS N
CLOCK DRIVER
EVF GND
EVF 5V
VIDEO GND
SS 5V
STILL
ACTER
ITION
(B-35)

no mark : REC/PB mode
( ) : REC mode
< > : PB mode


18
19
20
21
22
23
24
25
26
27
28
IC201 (D-37)
CXA1201Q
AGC/VIDEO OUT
INPUT SELECT
Q209 2SA812
Q209 (C-37)
VIDEO BUFFER
(C-6)
IC202
CXL1502M
CCD COMB FILTER
AUTO BIAS P
AUTO BIAS N
CLOCK DRIVER
BIAS A
BIAS B
(F-35)
IC203
CXA1200BQ
Y/C PROCESS
Y/C SEP
CCD I/O
LPF-1
LPF-2
LPF-3
CCD FL
NCSHP
SSAGC
MODEM
EMPHA
AFPC
VXO
LOGIC
CMAIN
(F-38)(F-38)(F-37)
Q401,403,405
REC Y AMP,
PB Y PEAKING
Q405 2SC1623
Q401 XN4601
Q403 XN1501
EMPH INPUT LEVEL
Q410 (H-37)
SUB TRACT
(H-38) Q409 2SC2223
(G-38) Q407 2SC1623
(G-37) Q406 2SC1623
Q409 EQ
(G-38) Q408 2SA812
Q406-408
HALF H SHIFT
CANCEL
(G-6) Q243
FSC BUFFER
(G-5) D216 MA159
(G-5) D217 MA159
Q215 (H-36)
TRAP FREQ SW
Q254 (G-6)
CHROMA BUFFER
(E-34) Q216
PB VIDEO BUFFER
(F-7) Q217
Y BUFFER
Q213, Q241, 242
QUASI HD GENERATOR
(G-34)(G-8)
Q226,227
CHARACTOR SWITCH
(G-34) Q232
BUFFER
(C-3) Q210
SWITCH
PB VIDEO OUT LEVEL
DEV
CAR SET
PB Y LEVEL
REC Y
X201 4.43MHz
FL203
FL202
FL201
C.BPF
PB C TRAP
< 1 2 3 >
< 1 2 3 4 >

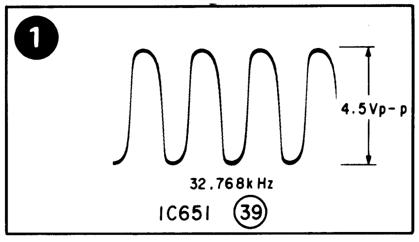
no mark : REC/PB mode
( ) : REC mode
< > : PB mode

CV-9 BOARD (1/3) (VIDEO BLOCK)

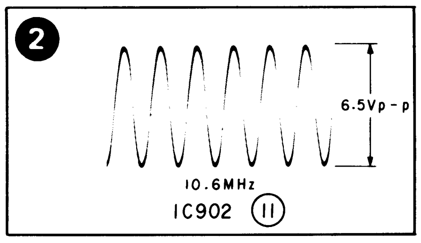
LI-10 (TITLE CONTROL), CK-19P (CAMERA FUNCTION SWITCH), DK-4P (EDIT SEARCH SWITCH) PRINTED WIRING BOARDS

— Ref. No. LI-10 BOARD: 3000 series, CK-19P BOARD: 4000 series, DK-4P BOARD:5000 series —

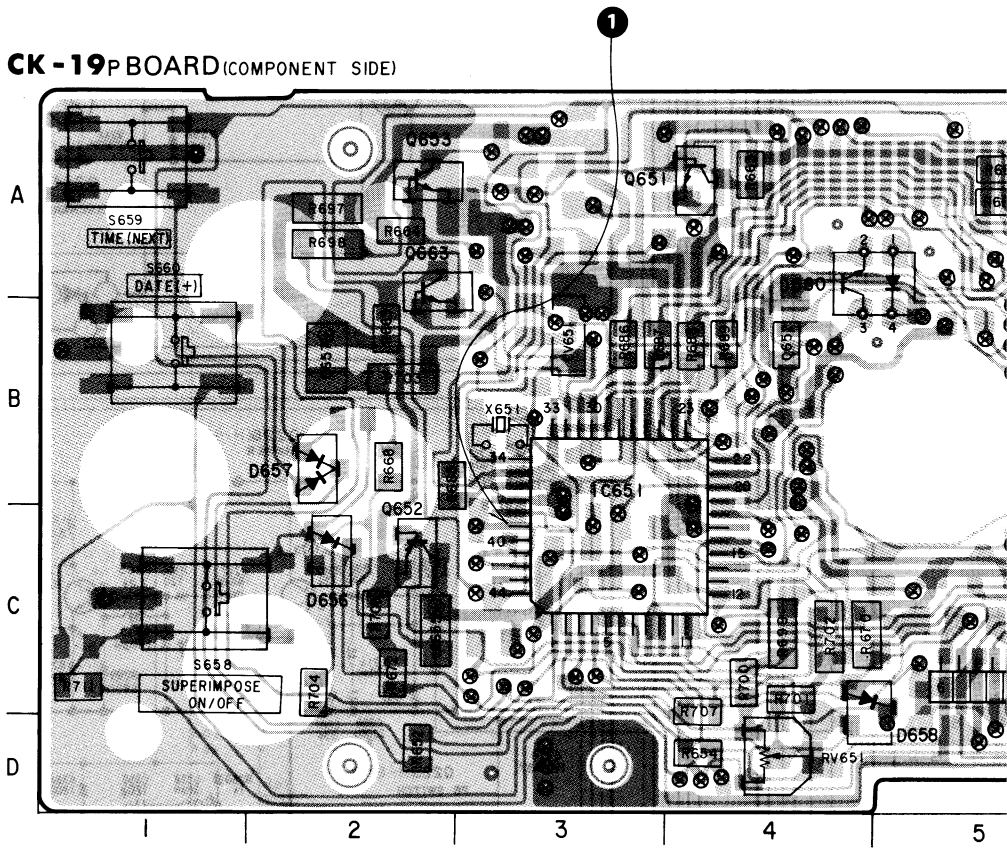
CK-19P BOARD



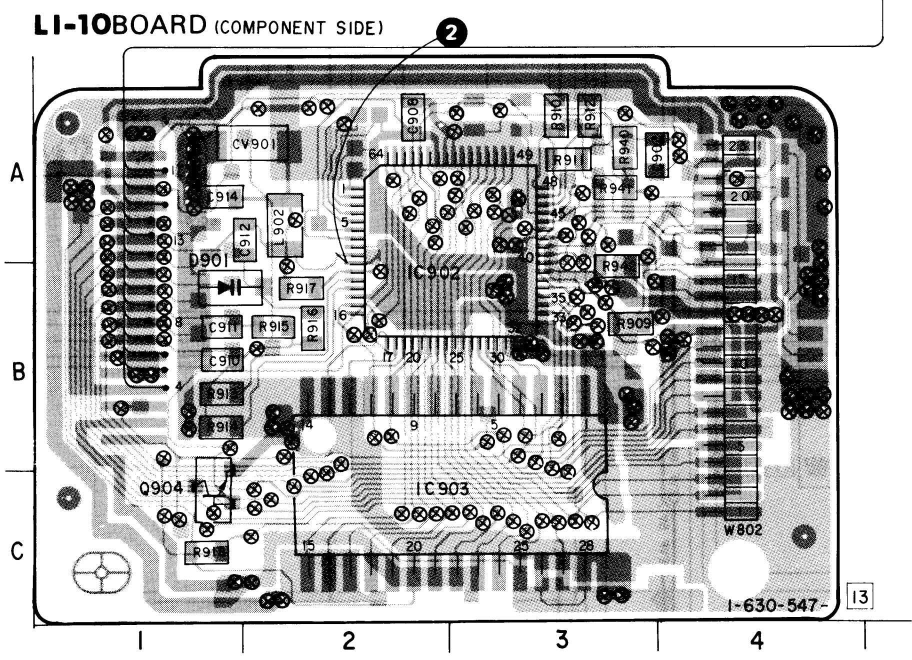
LI-10 BOARD

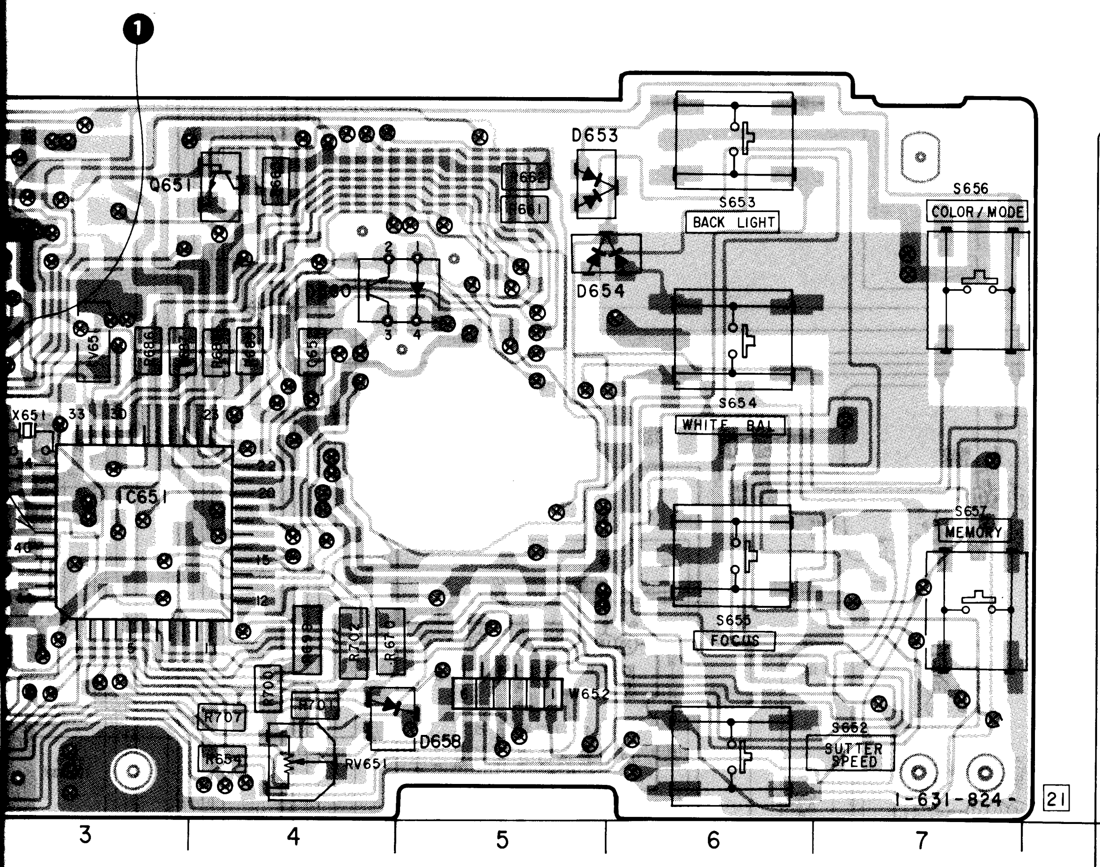


CK-19P BOARD (COMPONENT SIDE)

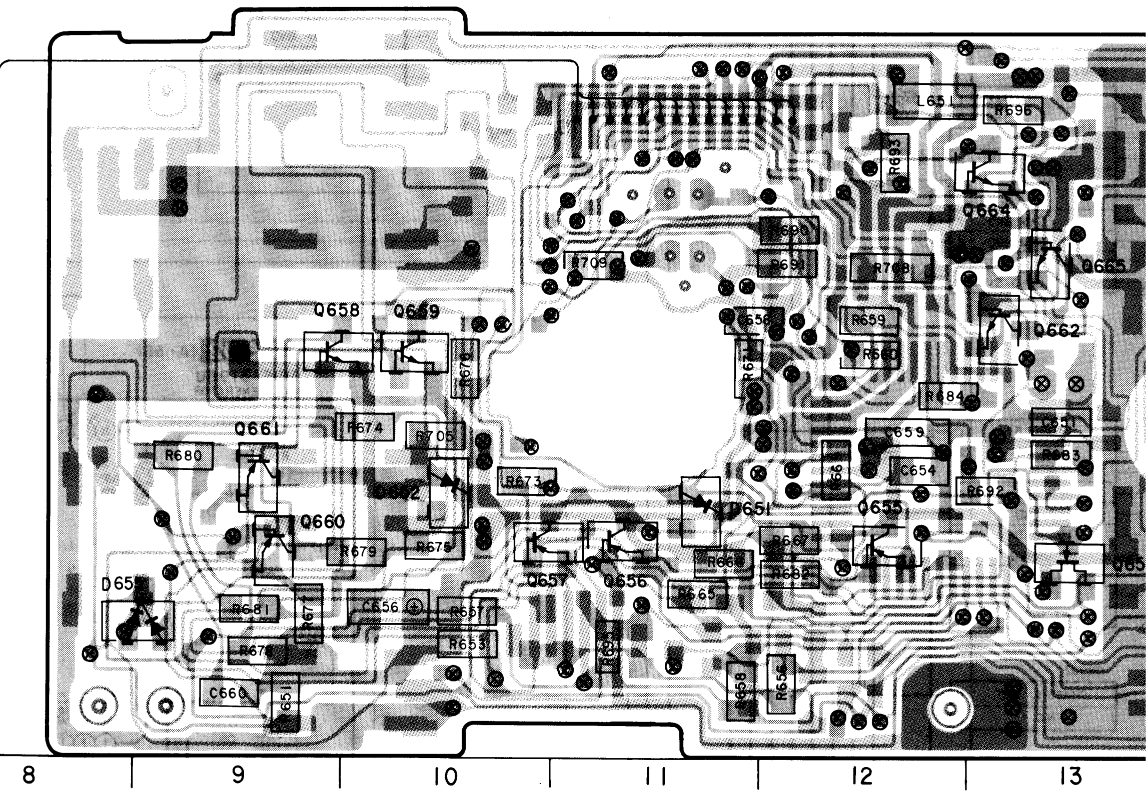

❶
A
B
C
D
1
2
3
4
5
Q653
Q651
S659
TIME (NEXT)
S660
DATE (+)
R697
R698
Q663
X651
IC651
D657
D656
Q652
R668
S658
SUPERIMPOSE ON/OFF
R704
R707
R700
D658
RV651

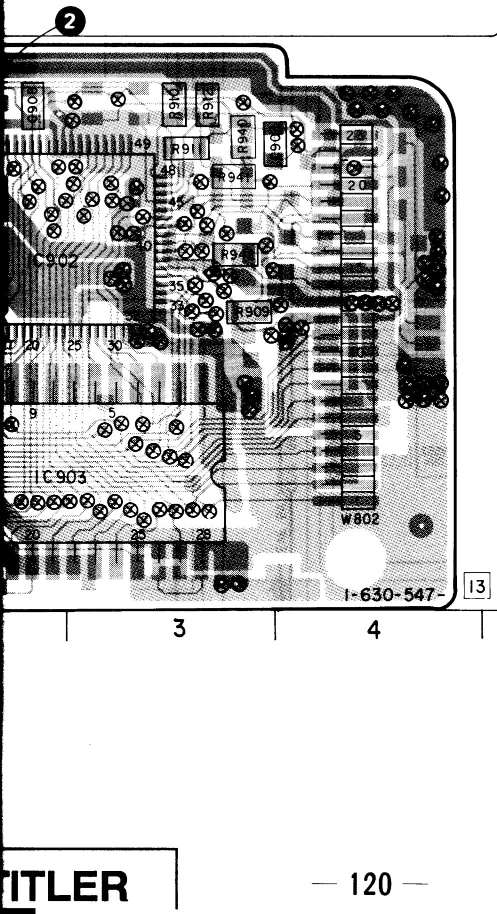
LI-10 BOARD (COMPONENT SIDE)


❷
A
B
C
1
2
3
4
CV901
L914
C912
L902
D901
R917
R915
R916
C911
C910
IC902
R909
R911
R912
R910
C908
Q904
IC903
R918
W802
1-630-547-
13

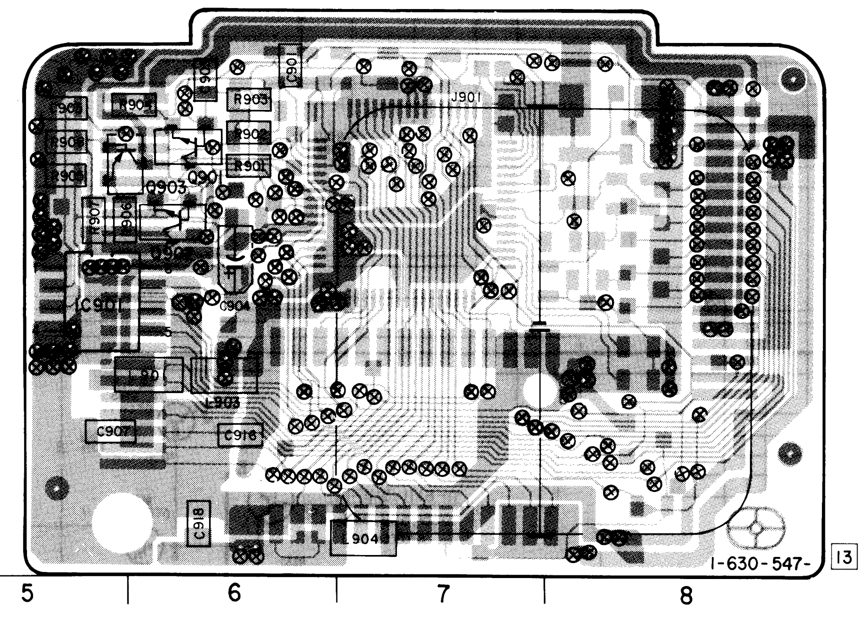

❶
D653
D654
S653
BACK LIGHT
S656
COLOR/MODE
S654
WHITE BAL
S657
MEMORY
S655
FOCUS
S652
SUTTER SPEED
Q651
IC651
D658
RV651
W652
1-631-824- 21
3
4
5
6
7

CK-19P BOARD (CONDUCTOR SIDE)

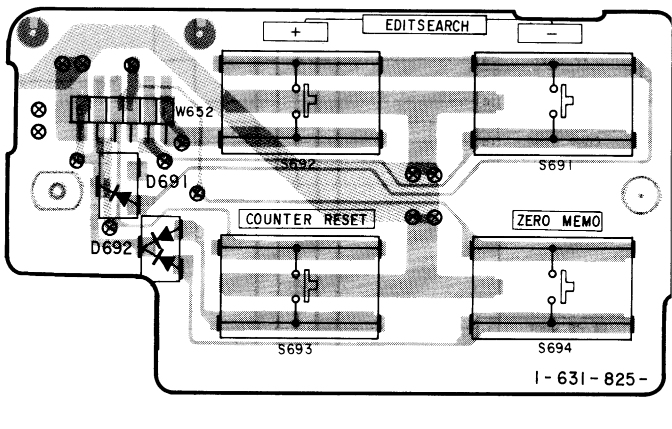

Q658
Q659
Q661
Q660
Q657
Q656
Q655
Q664
Q665
D662
D651
R680
R674
R705
R679
R678
R681
C656
C660
L651
R696
R708
R709
R659
C654
8
9
10
11
12
13

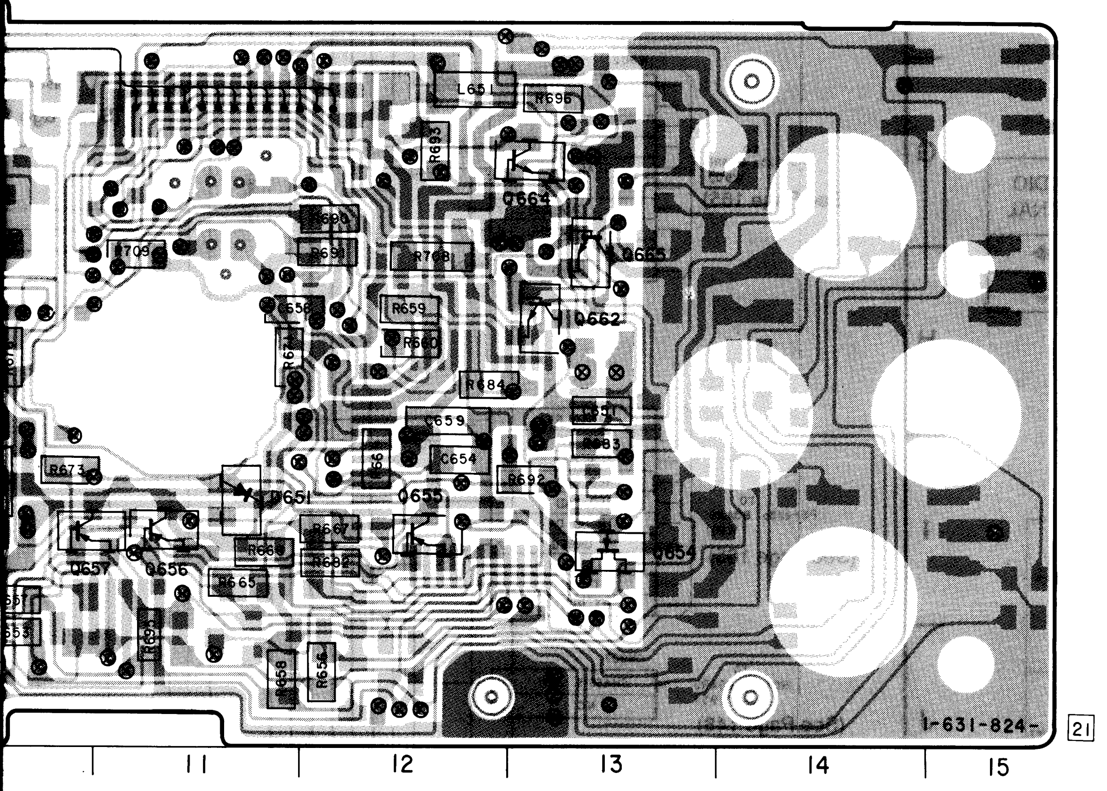

❷
IC902
IC903
R909
W802
1-630-547- 13
3
4

LI-10 BOARD (CONDUCTOR SIDE)

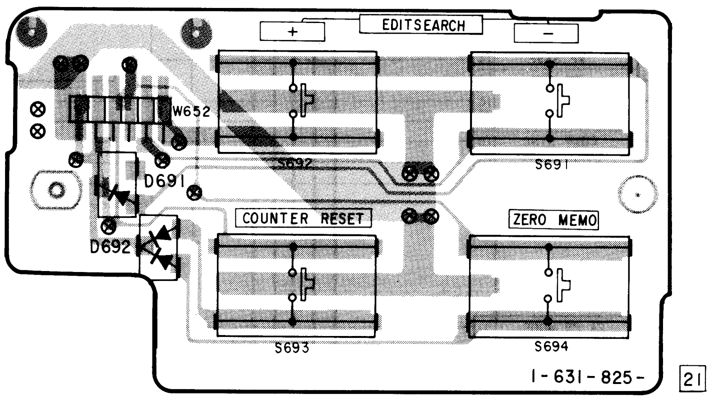

J901
Q903
IC901
C907
C916
C918
1-630-547- 13
5
6
7
8

DK-4P BOARD (COMPONENT SIDE)

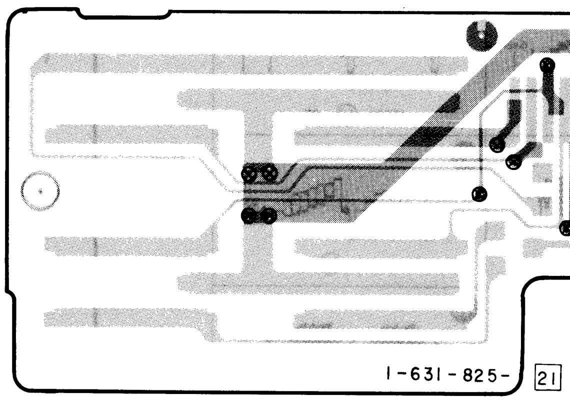

+
EDITSEARCH
−
W652
D691
D692
S692
S691
COUNTER RESET
ZERO MEMO
S693
S694
1-631-825-


L651
R696
R693
Q664
R690
R691
R709
R708
Q663
R659
R660
Q662
R684
C659
C654
R673
Q651
Q655
R692
Q654
Q657
Q656
R668
R667
R682
R665
R658
R654
1-631-824-
21
11
12
13
14
15

DK-4 PBOARD (COMPONENT SIDE)

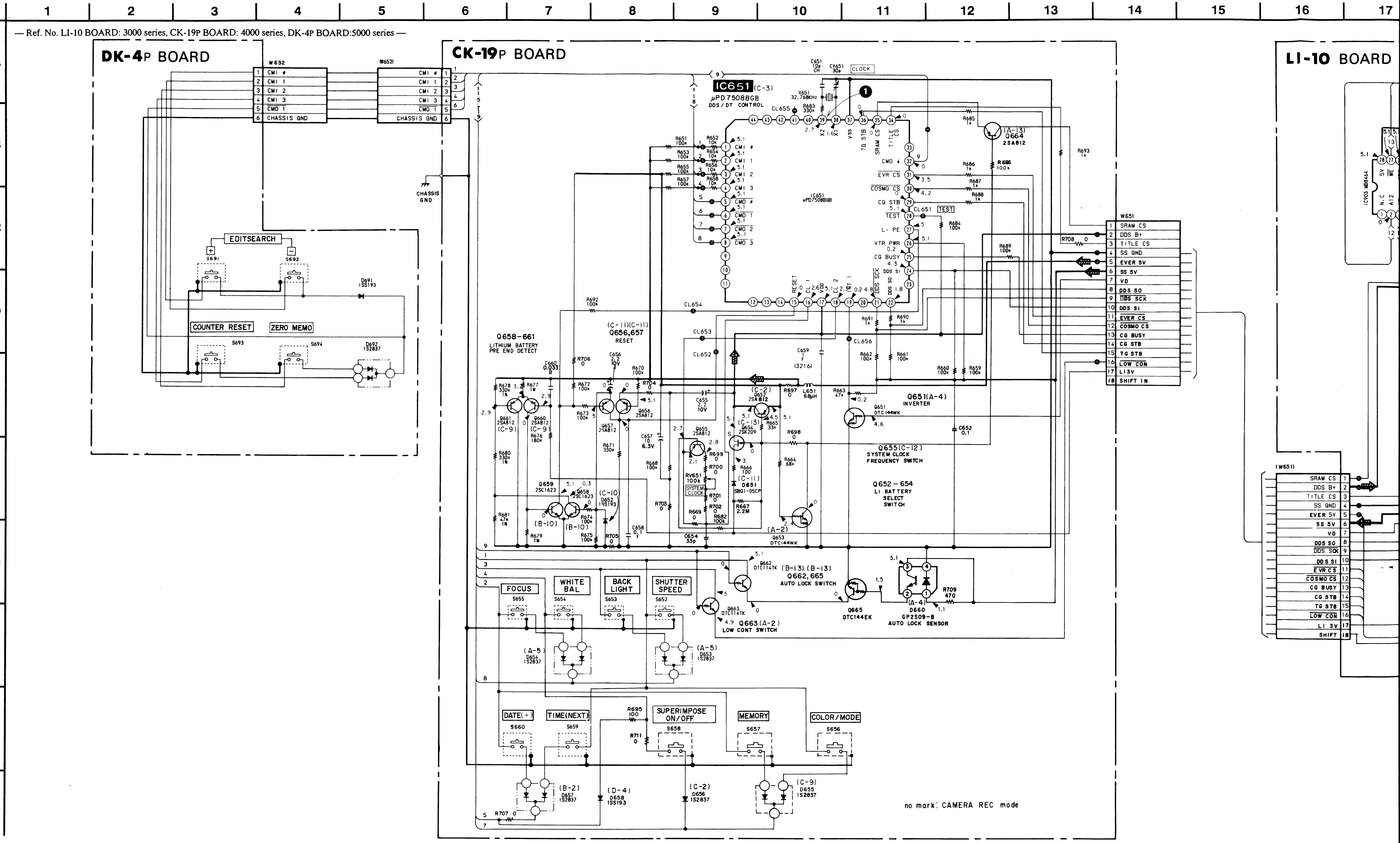

+
EDITSEARCH
−
W652
D691
D692
S692
S691
COUNTER RESET
ZERO MEMO
S693
S694
1-631-825-
21

DK-4 PBOARD (CONDUCTOR SIDE)



LI-10 (TITLE CONTROL), CK-19P (CAMERA FUNCTION SWITCH), DK-4P (EDIT SEARCH SWITCH) SCHEMATIC DIAGRAMS

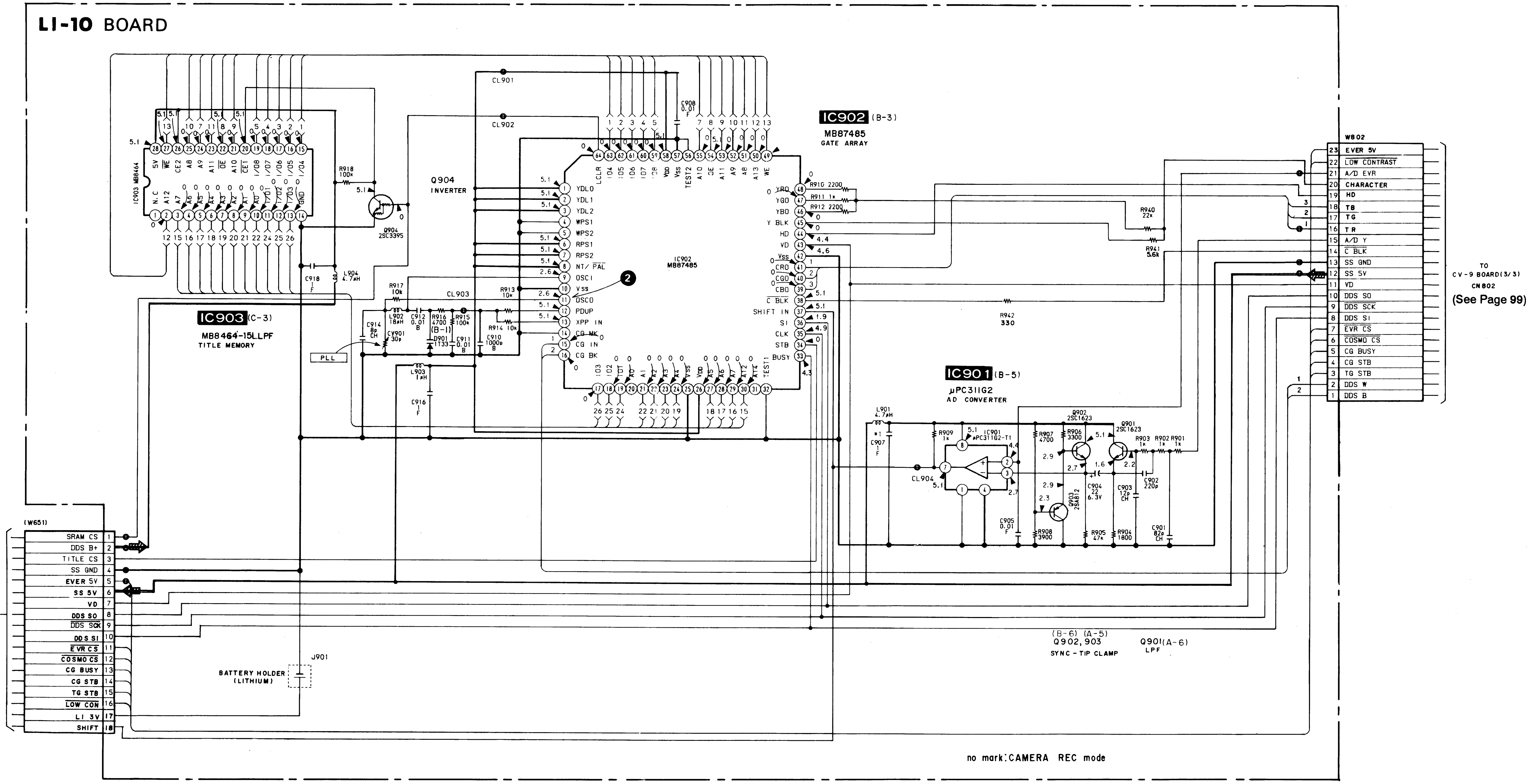
— Ref. No. LI-10 BOARD: 3000 series, CK-19P BOARD: 4000 series, DK-4P BOARD:5000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
DK-4P BOARD
W652
CMI φ
CMI 1
CMI 2
CMI 3
CMO 1
CHASSIS GND
EDITSEARCH
S691
S692
D691 1SS193
COUNTER RESET
ZERO MEMO
S693
S694
D692 1S2837
CHASSIS GND
CK-19P BOARD
IC651 (C-3)
μPD7508BGB
DDS/DT CONTROL
CLOCK
X651 32.768KHz
TEST
Q658-661
LITHIUM BATTERY PRE END DETECT
(C-11)(C-11)
Q656,657
RESET
Q651(A-4)
INVERTER
Q655(C-12)
SYSTEM CLOCK FREQUENCY SWITCH
Q652 - 654
LI BATTERY SELECT SWITCH
Q664 2SA812
Q662,665
AUTO LOCK SWITCH
Q663(A-2)
LOW CONT SWITCH
D660 GP2S09-B
AUTO LOCK SENSOR
FOCUS
S655
WHITE BAL
S654
BACK LIGHT
S653
SHUTTER SPEED
S652
DATE(+)
S660
TIME(NEXT)
S659
SUPERIMPOSE ON/OFF
S658
MEMORY
S657
COLOR/MODE
S656
W651
SRAM CS
DDS B+
TITLE CS
SS GND
EVER 5V
SS 5V
VD
DDS SO
DDS SCK
DDS SI
EVER CS
COSMO CS
CG BUSY
CG STB
TG STB
LOW CON
LI 3V
SHIFT IN
LI-10 BOARD
(W651)
SHIFT
IC903 MB8464

no mark: CAMERA REC mode

15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

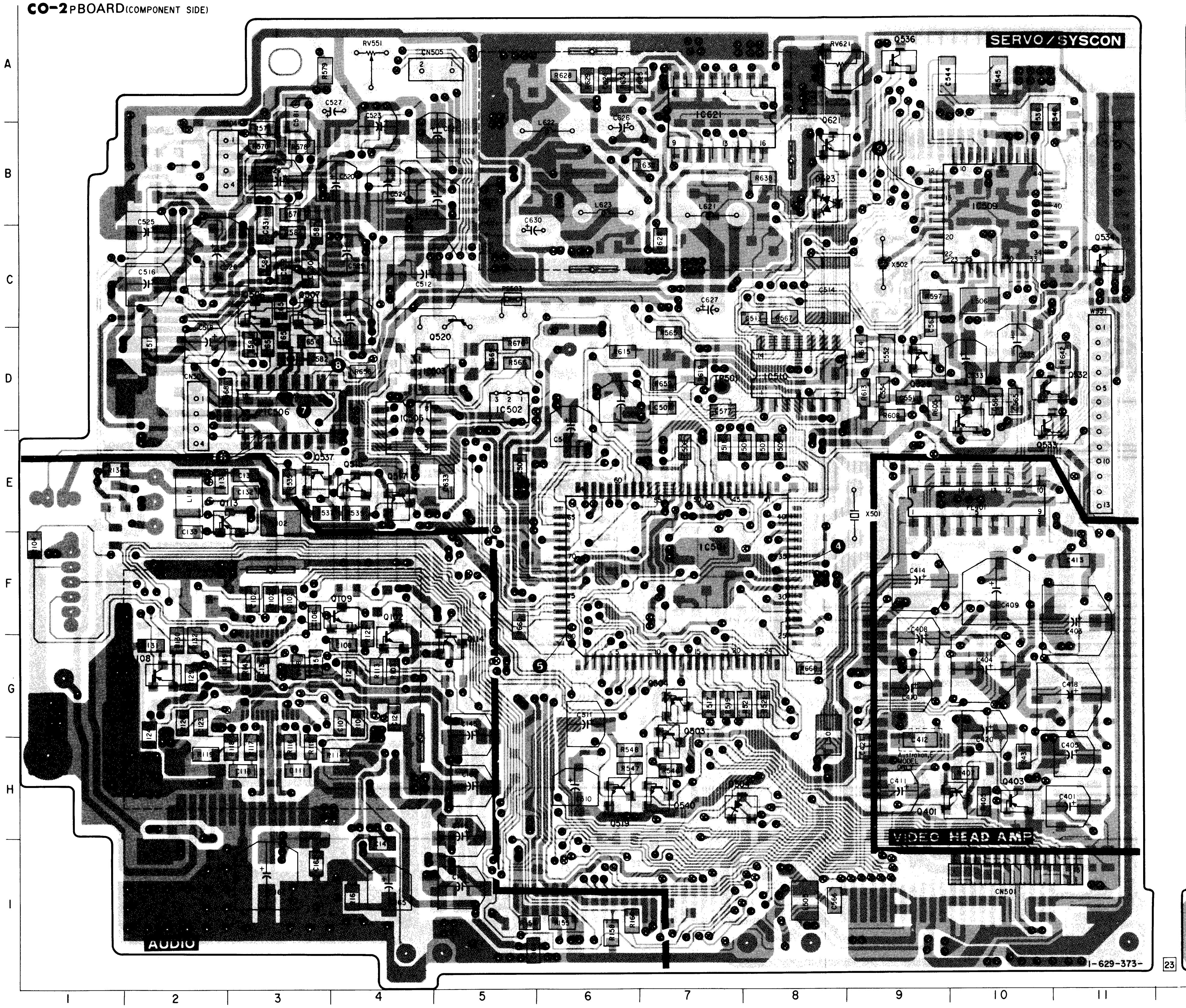
LI-10 BOARD


IC903 (C-3)
MB8464-15LLPF
TITLE MEMORY
IC903 MB8464
5V
WE
CE2
A8
A9
A11
OE
A10
CE1
I/O8
I/O7
I/O6
I/O5
I/O4
N.C
A12
A7
A6
A5
A4
A3
A2
A1
A0
I/O1
I/O2
I/O3
GND
R918 100k
Q904 INVERTER
Q904 2SC3395
C918 1 F
L904 4.7μH
CL901
CL902
CL903
C908 0.01 F
IC902 (B-3)
MB87485
GATE ARRAY
IC902 MB87485
YDL0
YDL1
YDL2
WPS1
WPS2
RPS1
RPS2
NT/PAL
OSC1
Vss
OSCO
PDUP
XPP IN
CG WK
CG IN
CG BK
LCLR
IO4
IO5
IO6
IO7
IO8
VDD
Vss
TEST2
A10
OE
A11
A9
A8
A13
WE
IO3
IO2
IO1
A0
A1
A2
A3
A4
Vss
VDD
A5
A6
A7
A12
A14
TEST1
YRO
YGO
YBO
Y BLK
HD
VD
Vss
CRO
CGO
CBO
C BLK
SHIFT IN
SI
CLK
STB
BUSY
R910 2200
R911 1k
R912 2200
R917 10k
L902 18μH
C912 0.01 B
R916 4700
R915 100k
C914 8p CH
CV901 30p
D901 1T33
C911 0.01 B
C910 1000p B
R913 10k
R914 10k
PLL
L903 1μH
C916 1 F
R940 22k
R941 5.6k
R942 330
IC901 (B-5)
μPC311G2
AD CONVERTER
L901 4.7μH
C907 1 F
CL904
R909 1k
IC901 μPC311G2-T1
R907 4700
R906 3300
Q902 2SC1623
Q901 2SC1623
R903 1k
R902 1k
R901 1k
C904 22 6.3V
C903 12p CH
C902 220p
Q903 2SA812
C905 0.01 F
R908 3900
R905 47k
R904 1800
C901 82p CH
(B-6) (A-5)
Q902, 903
SYNC-TIP CLAMP
Q901 (A-6)
LPF
J901
BATTERY HOLDER (LITHIUM)
(W651)
1 SRAM CS
2 DDS B+
3 TITLE CS
4 SS GND
5 EVER 5V
6 SS 5V
7 VD
8 DDS SO
9 DDS SCK
10 DDS SI
11 EVR CS
12 COSMO CS
13 CG BUSY
14 CG STB
15 TG STB
16 LOW CON
17 LI 3V
18 SHIFT
W802
23 EVER 5V
22 LOW CONTRAST
21 A/D EVR
20 CHARACTER
19 HD
18 TB
17 TG
16 TR
15 A/D Y
14 C BLK
13 SS GND
12 SS 5V
11 VD
10 DDS SO
9 DDS SCK
8 DDS SI
7 EVR CS
6 COSMO CS
5 CG BUSY
4 CG STB
3 TG STB
2 DDS W
1 DDS B
TO CV-9 BOARD(3/3) CN802
(See Page 99)
no mark:CAMERA REC mode

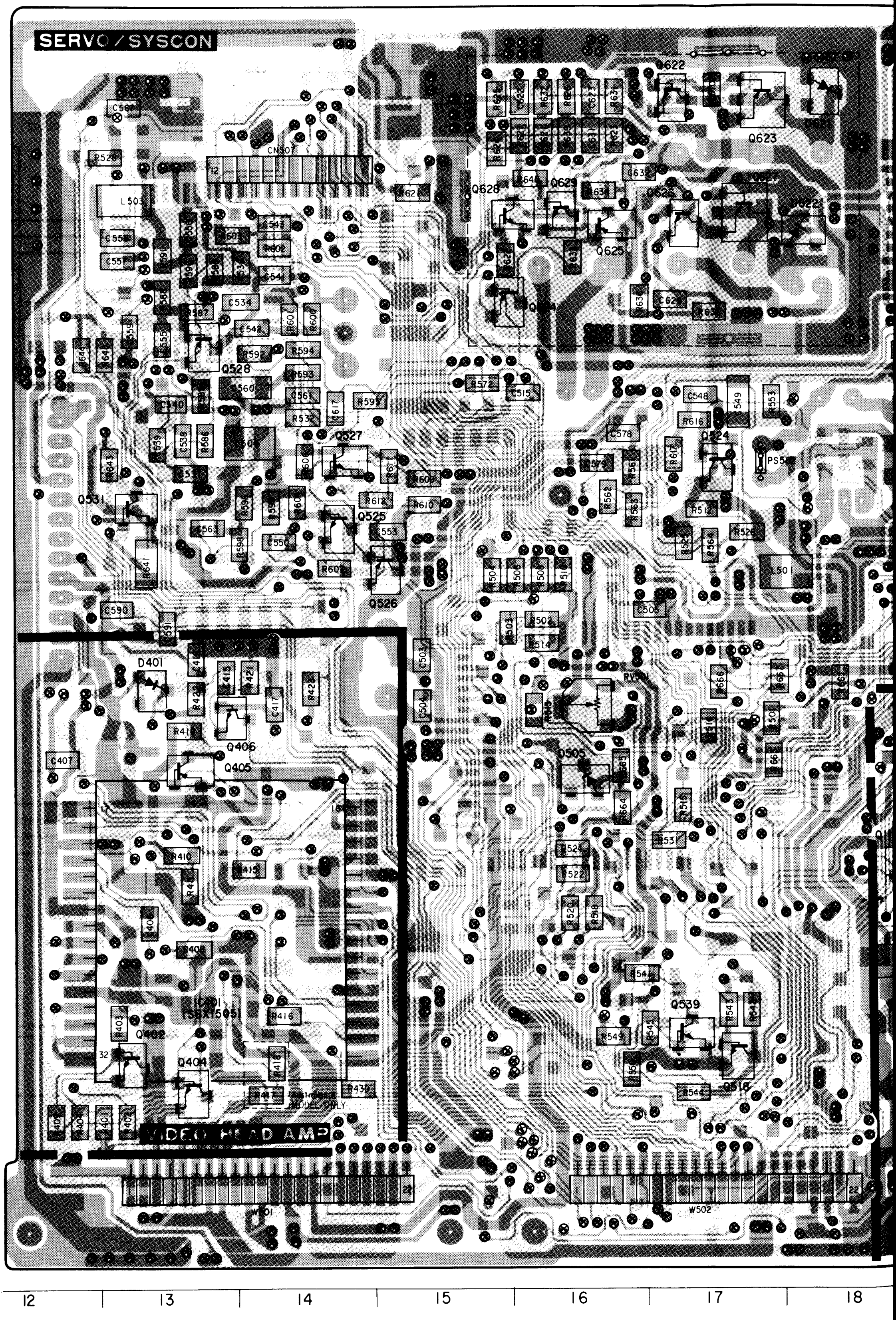
CO-2P (HEAD AMP, AUDIO/SERVO, SYSTEM CONTROL), CC-26P (TFG/SFG AMP), KS-6P (CAPSTAN MOTOR DRIVE JUNCTION), FP-89 (TAPE END SENSOR), FP-90 (TAPE TOP SENSOR) PRINTED WIRING BOARDS

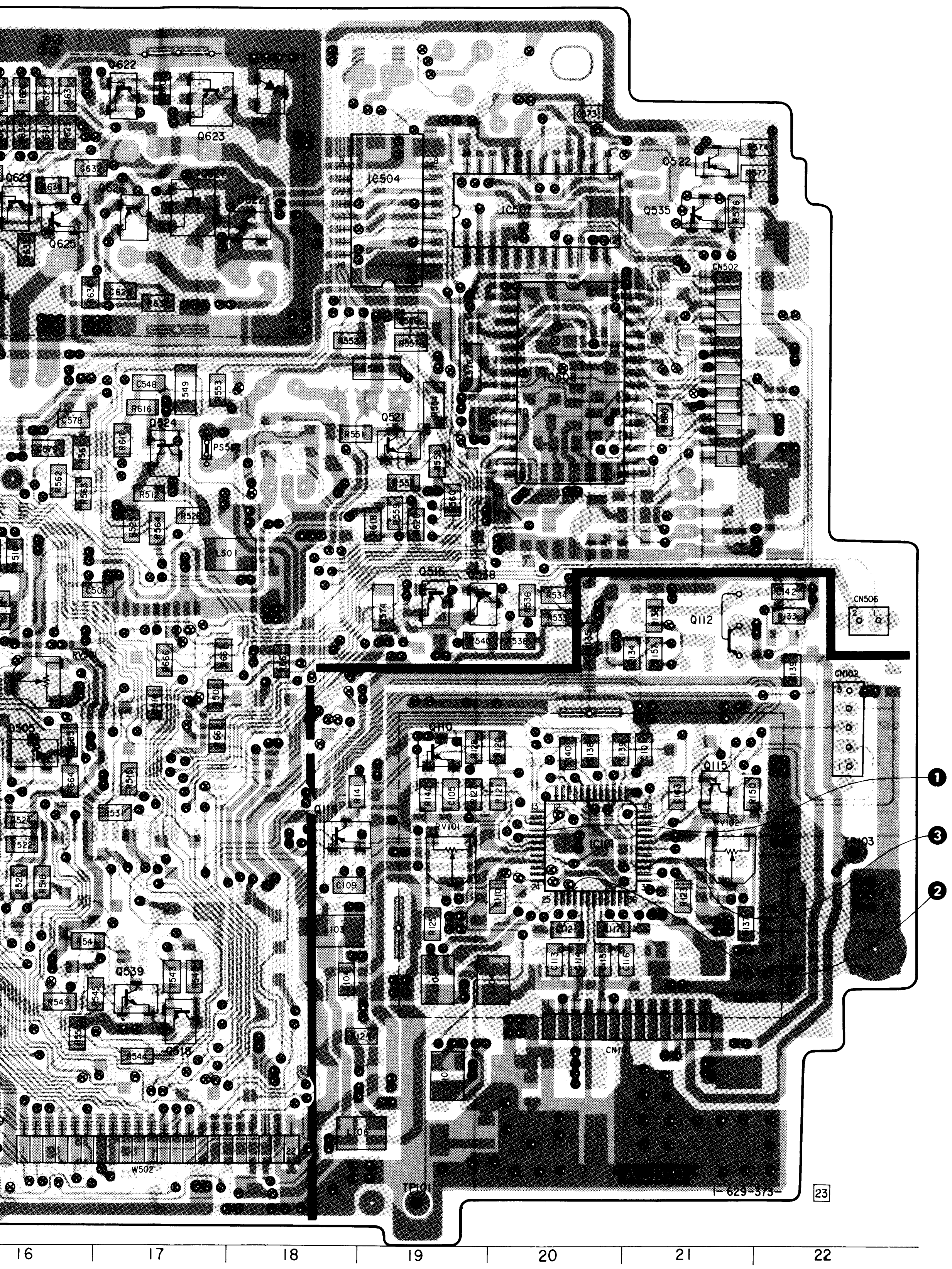
— Ref. No. CO-2P, FP-89 BOARDS: 6000 series, CC-26PBOARD: 7000 series, FP-90, KS-6P BOARDS: 8000 series —

CO-2PBOARD(COMPONENT SIDE)

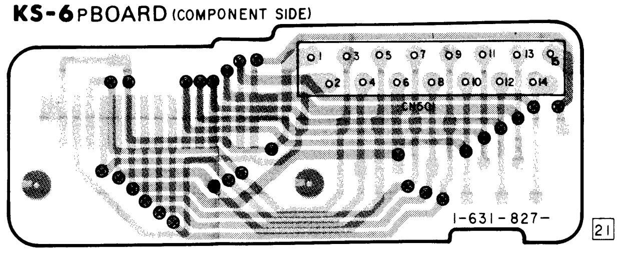

A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
8
9
10
11
SERVO/SYSCON
AUDIO
VIDEO HEAD AMP
RV551
CN505
RV621
Q536
IC621
L622
L623
L621
C630
C626
C627
IC501
X502
X501
Q520
Q537
IC502
IC505
IC506
Q109
Q503
Q540
Q519
Q401
Q403
CN501
W551
1-629-373-
23

CO-2PBOARD(CONDUCTOR SIDE)

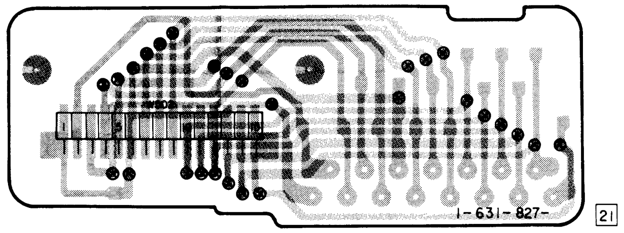

SERVO/SYSCON
VIDEO HEAD AMP
12
13
14
15
16
17
18
CN507
Q622
Q623
Q628
Q625
Q528
Q527
Q531
Q525
Q526
D401
Q406
Q405
Q505
Q402
Q404
Q539
IC401
(SBX1505)
W501
W502


Q622
Q623
Q625
IC504
IC502
IC503
Q522
Q535
CN502
Q524
Q521
L501
Q516
Q538
Q112
CN506
CN102
Q115
Q113
RV101
RV102
IC101
C109
Q539
Q518
W502
TP101
CN101
1-629-373-
23
1
2
3
16
17
18
19
20
21
22

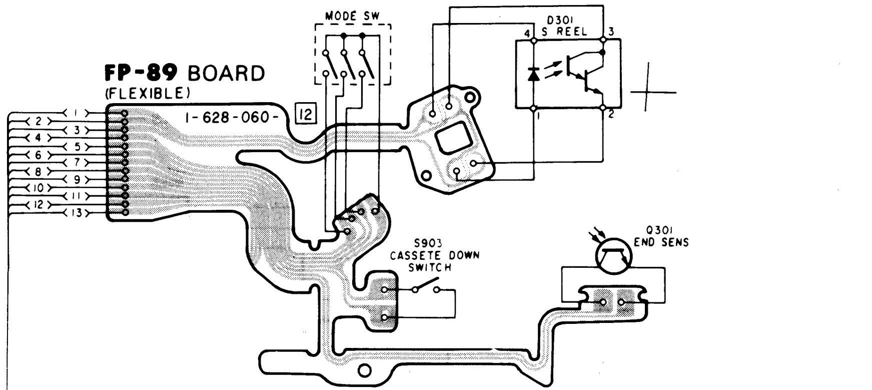
KS-6 P BOARD (COMPONENT SIDE)


CN601
1-631-827-
21

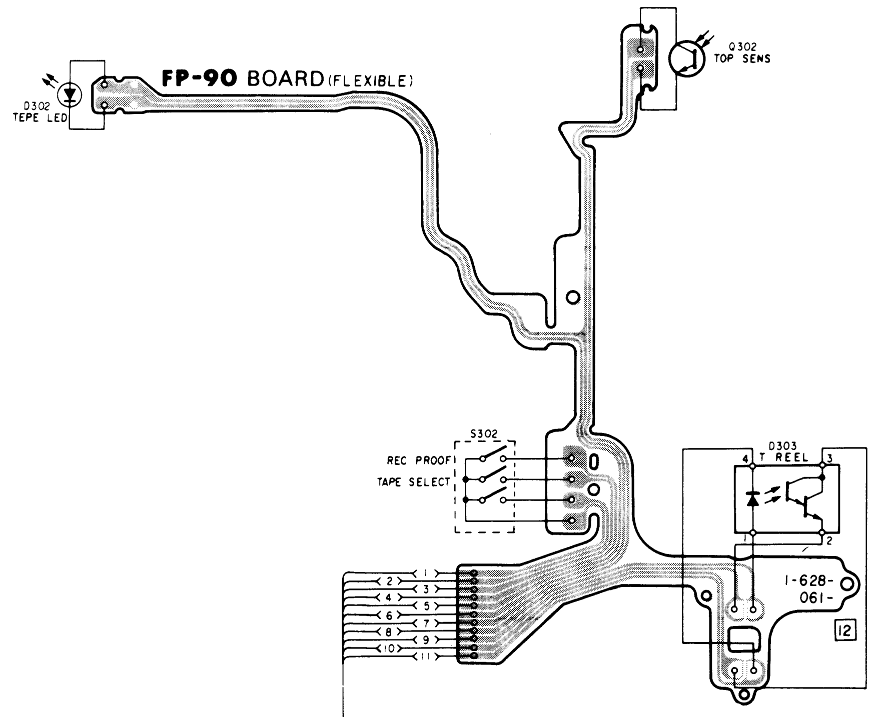
KS-6 P BOARD (CONDUCTOR SIDE)



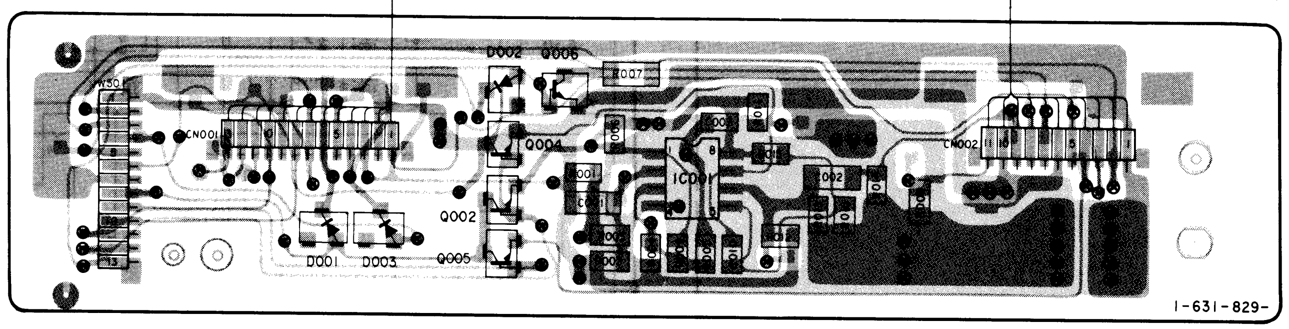
FP-89 BOARD (FLEXIBLE)


MODE SW
D301
S REEL
1-628-060-
12
S903
CASSETE DOWN SWITCH
Q301
END SENS

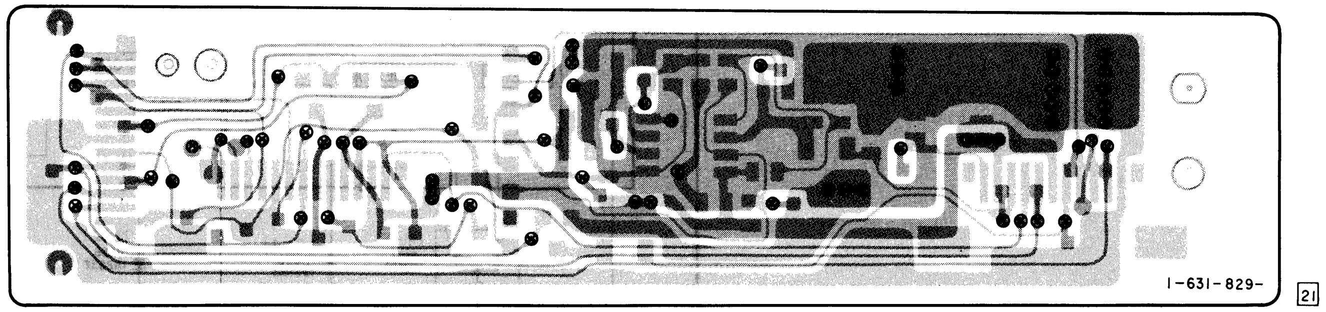
FP-90 BOARD (FLEXIBLE)


D302
TEPE LED
Q302
TOP SENS
S302
REC PROOF
TAPE SELECT
D303
T REEL
1-628-061-
12

CC-26 P BOARD (COMPONENT SIDE)

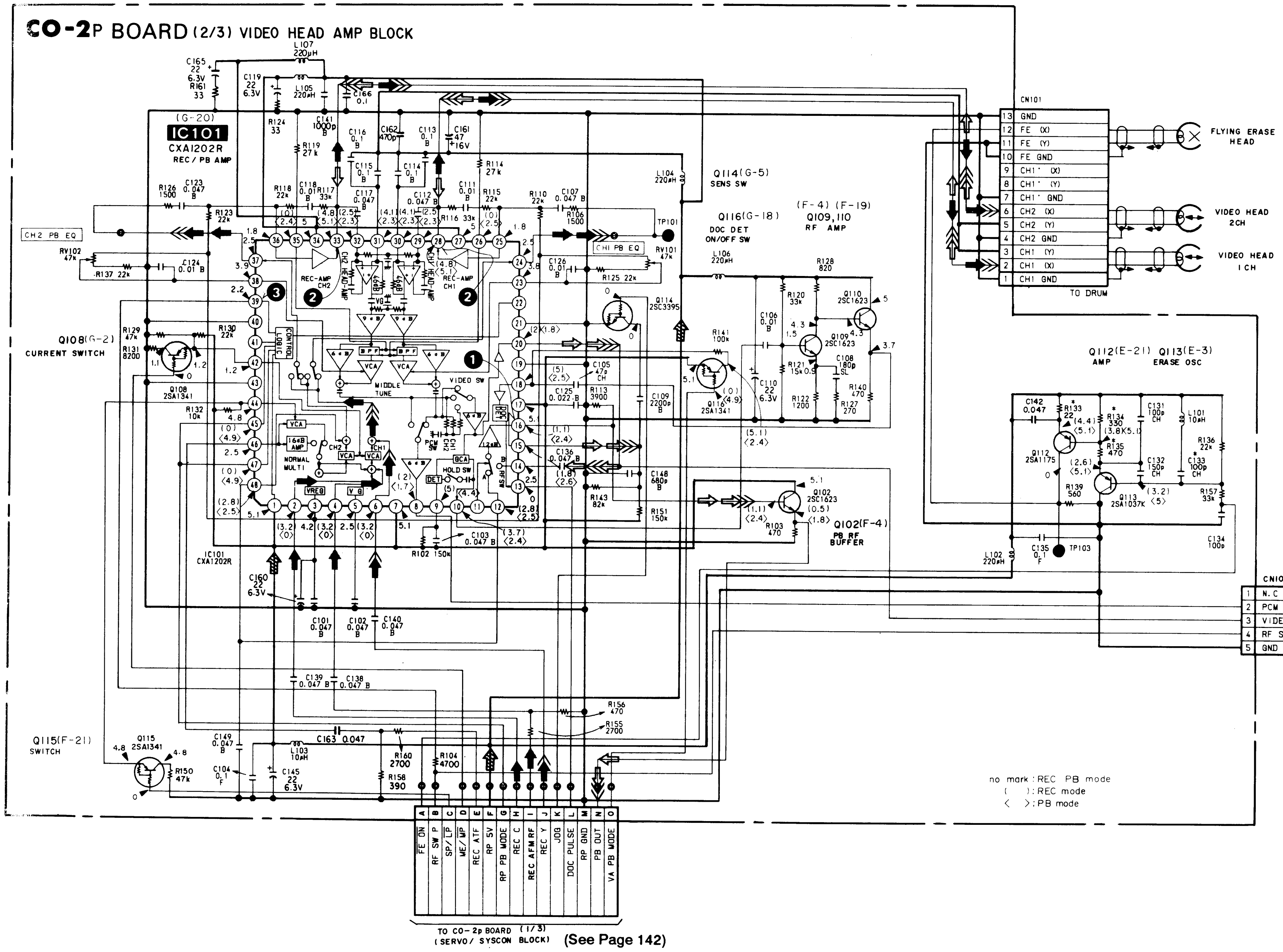

CN001
CN002
D002
Q006
Q004
Q002
D001
D003
Q005
IC001
1-631-829-

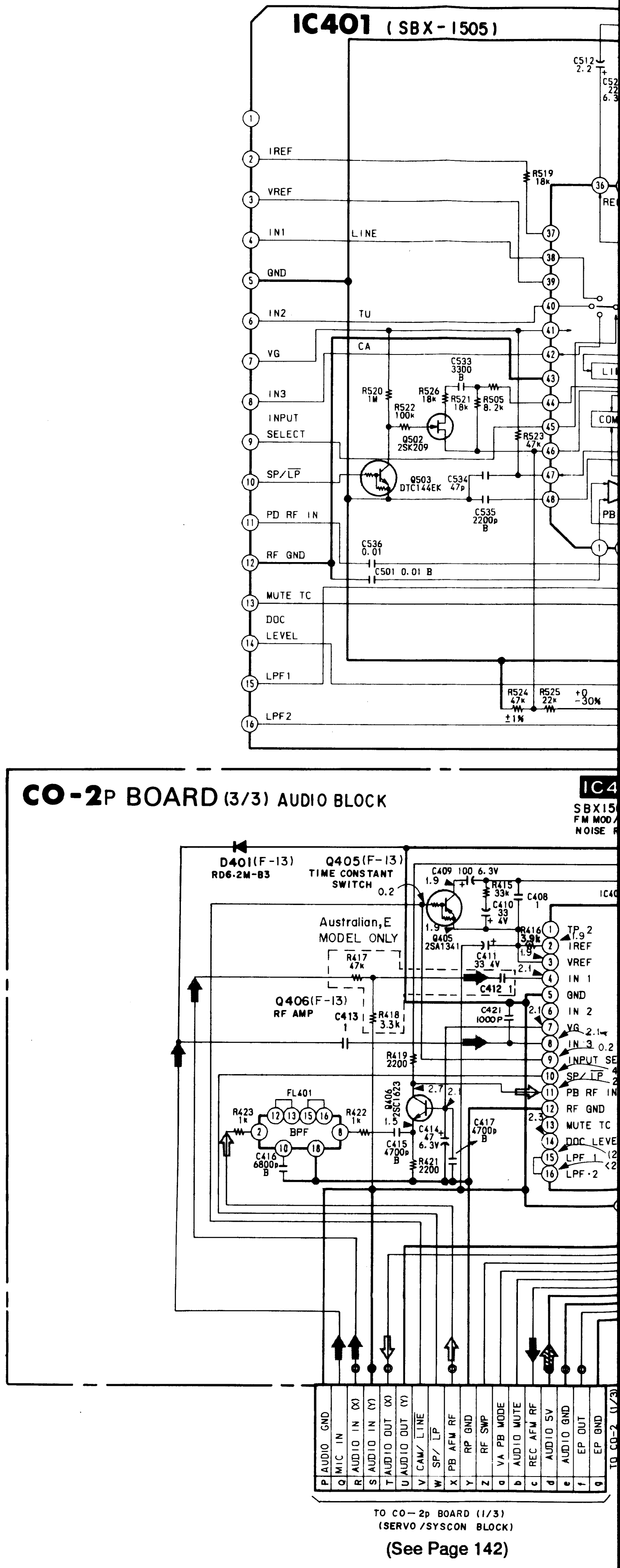
CC-26 P BOARD (CONDUCTOR SIDE)

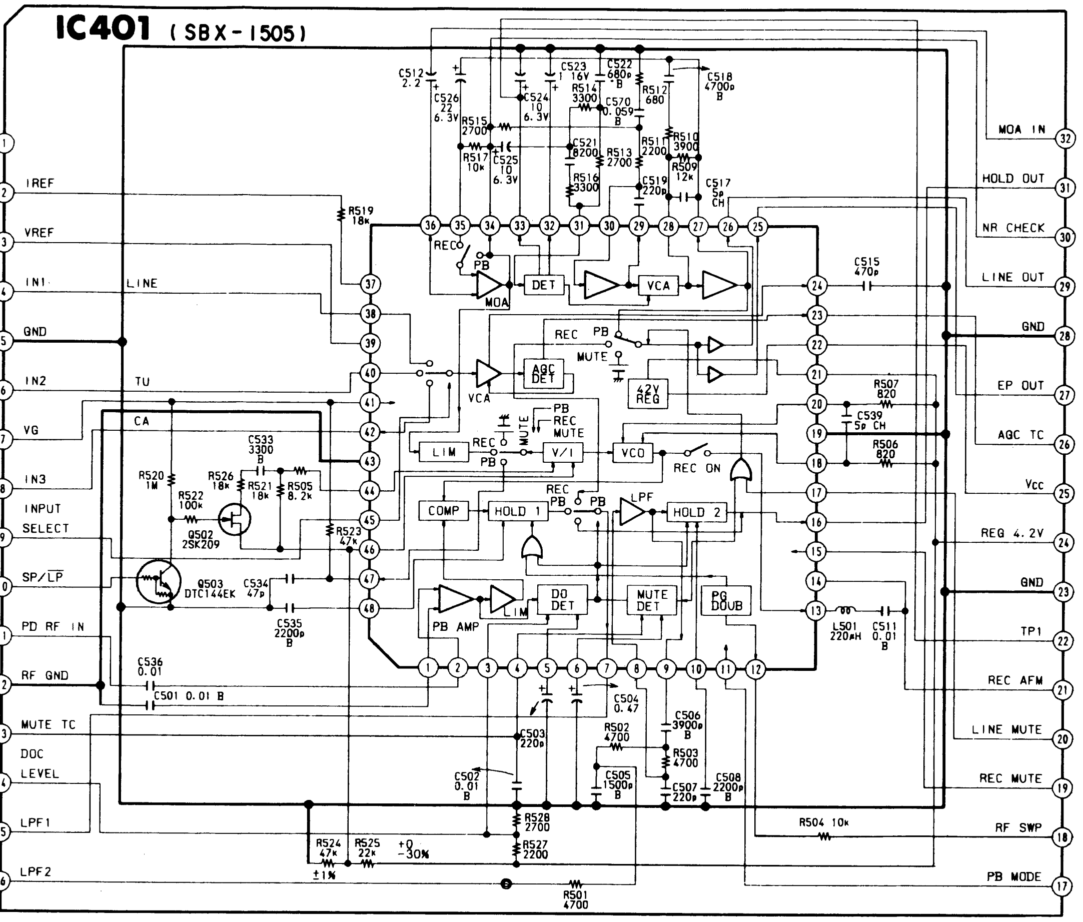


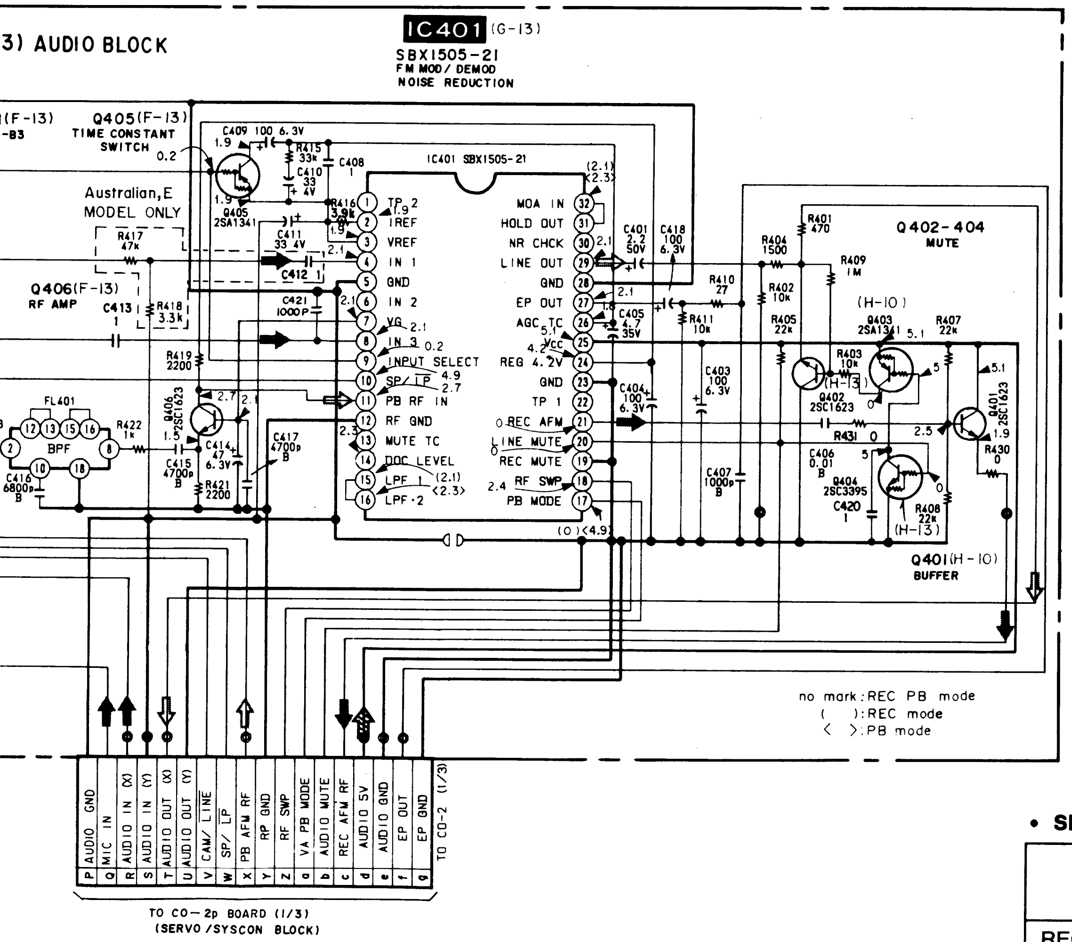
CO-2P (HEAD AMP, AUDIO/SERVO, SYSTEM CONTROL) SCHEMATIC DIAGRAMS

— Ref. No. CO-2P BOARD: 6000 series —


CO-2P BOARD (2/3) VIDEO HEAD AMP BLOCK
IC101
CXA1202R
REC/PB AMP
Q108(G-2) CURRENT SWITCH
Q114(G-5) SENS SW
Q116(G-18) DOC DET ON/OFF SW
Q109,110 RF AMP
Q102(F-4) PB RF BUFFER
Q112(E-21) AMP
Q113(E-3) ERASE OSC
Q115(F-21) SWITCH
CN101
GND
FE (X)
FE (Y)
FE GND
CH1' (X)
CH1' (Y)
CH1' GND
CH2 (X)
CH2 (Y)
CH2 GND
CH1 (Y)
CH1 (X)
CH1 GND
TO DRUM
FLYING ERASE HEAD
VIDEO HEAD 2CH
VIDEO HEAD 1CH
CN102
N.C
PCM OUT
VIDEO RF OUT
RF SW P
GND
CHECK PIN
FE ON
RF SW P
SP/LP
WE/WP
REC ATF
RP 5V
RP PB MODE
REC C
REC AFM RF
REC Y
JOG
DOC PULSE
RP GND
PB OUT
VA PB MODE
TO CO-2P BOARD (1/3) (SERVO/SYSCON BLOCK)
(See Page 142)
no mark : REC PB mode
( ) : REC mode
< > : PB mode


IC401 (SBX-1505)
IREF
VREF
IN1
GND
IN2
VG
IN3
INPUT SELECT
SP/LP
PD RF IN
RF GND
MUTE TC
DOC LEVEL
LPF1
LPF2
CO-2P BOARD (3/3) AUDIO BLOCK
D401(F-13) RD6.2M-B3
Q405(F-13) TIME CONSTANT SWITCH
Australian,E MODEL ONLY
Q406(F-13) RF AMP
FL401 BPF
AUDIO GND
MIC IN
AUDIO IN (X)
AUDIO IN (Y)
AUDIO OUT (X)
AUDIO OUT (Y)
CAM/LINE
SP/LP
PB AFM RF
RP GND
RP SWP
VA PB MODE
REC AFM RF
AUDIO 5V
AUDIO GND
EP OUT
EP GND
TO CO-2P BOARD (1/3) (SERVO/SYSCON BLOCK)
(See Page 142)

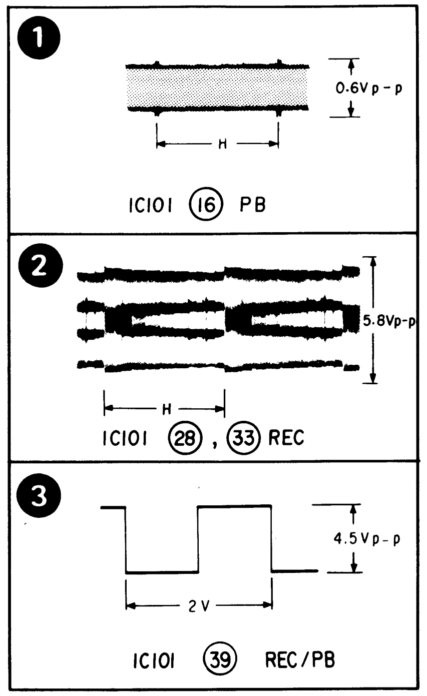

IC401 (SBX-1505)
IREF
VREF
IN1
GND
IN2
VG
IN3
INPUT SELECT
SP/LP
PD RF IN
RF GND
MUTE TC
DOC LEVEL
LPF1
LPF2
LINE
TU
CA
MOA IN 32
HOLD OUT 31
NR CHECK 30
LINE OUT 29
GND 28
EP OUT 27
AGC TC 26
Vcc 25
REG 4.2V 24
GND 23
TP1 22
REC AFM 21
LINE MUTE 20
REC MUTE 19
RF SWP 18
PB MODE 17
MOA
DET
VCA
AGC DET
LIM
V/I
VCO
REC ON
4.2V REG
COMP
HOLD 1
LPF
HOLD 2
PB AMP
DO DET
MUTE DET
PG DOUB
REC
PB
MUTE
Q502 2SK209
Q503 DTC144EK
L501 220μH
R504 10k
R501 4700
+0 -30%
±1%


3) AUDIO BLOCK
IC401 (G-13)
SBX1505-21
FM MOD/DEMOD
NOISE REDUCTION
Q405(F-13)
TIME CONSTANT SWITCH
Australian,E MODEL ONLY
Q406(F-13)
RF AMP
FL401
BPF
IC401 SBX1505-21
TP 2
IREF
VREF
IN 1
GND
IN 2
VG
IN 3
INPUT SELECT
SP/LP
PB RF IN
RF GND
MUTE TC
DOC LEVEL
LPF 1
LPF 2
MOA IN
HOLD OUT
NR CHCK
LINE OUT
GND
EP OUT
AGC TC
REG 4.2V
GND
TP 1
REC AFM
LINE MUTE
REC MUTE
RF SWP
PB MODE
Q402-404
MUTE
(H-10)
Q403 2SA1341
Q402 2SC1623
Q404 2SC3395
(H-13)
Q401(H-10)
BUFFER
Q401 2SC1623
AUDIO GND
MIC IN
AUDIO IN (X)
AUDIO IN (Y)
AUDIO OUT (X)
AUDIO OUT (Y)
CAM/LINE
SP/LP
PB AFM RF
RP GND
RF SWP
VA PB MODE
REC AFM RF
AUDIO 5V
AUDIO GND
EP OUT
EP GND
TO CO-2 (1/3)

no mark: REC PB mode
( ): REC mode
< >: PB mode

TO CO-2p BOARD (1/3)
(SERVO/SYSCON BLOCK)
(See Page 142)

CO-2P BOARD (HEADAMP)



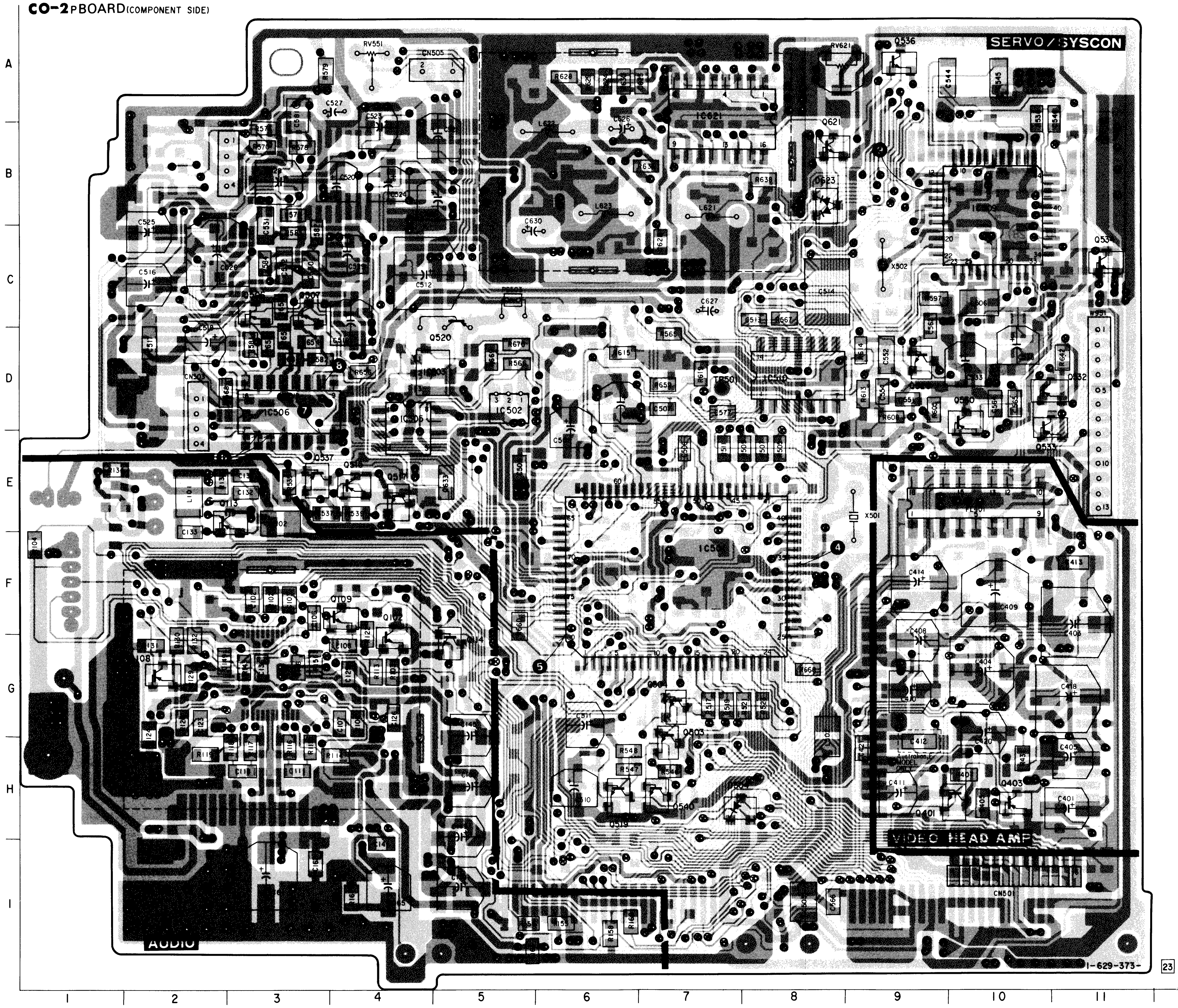
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	➡»	➡≫	➡
PB			⇨≫	⇨

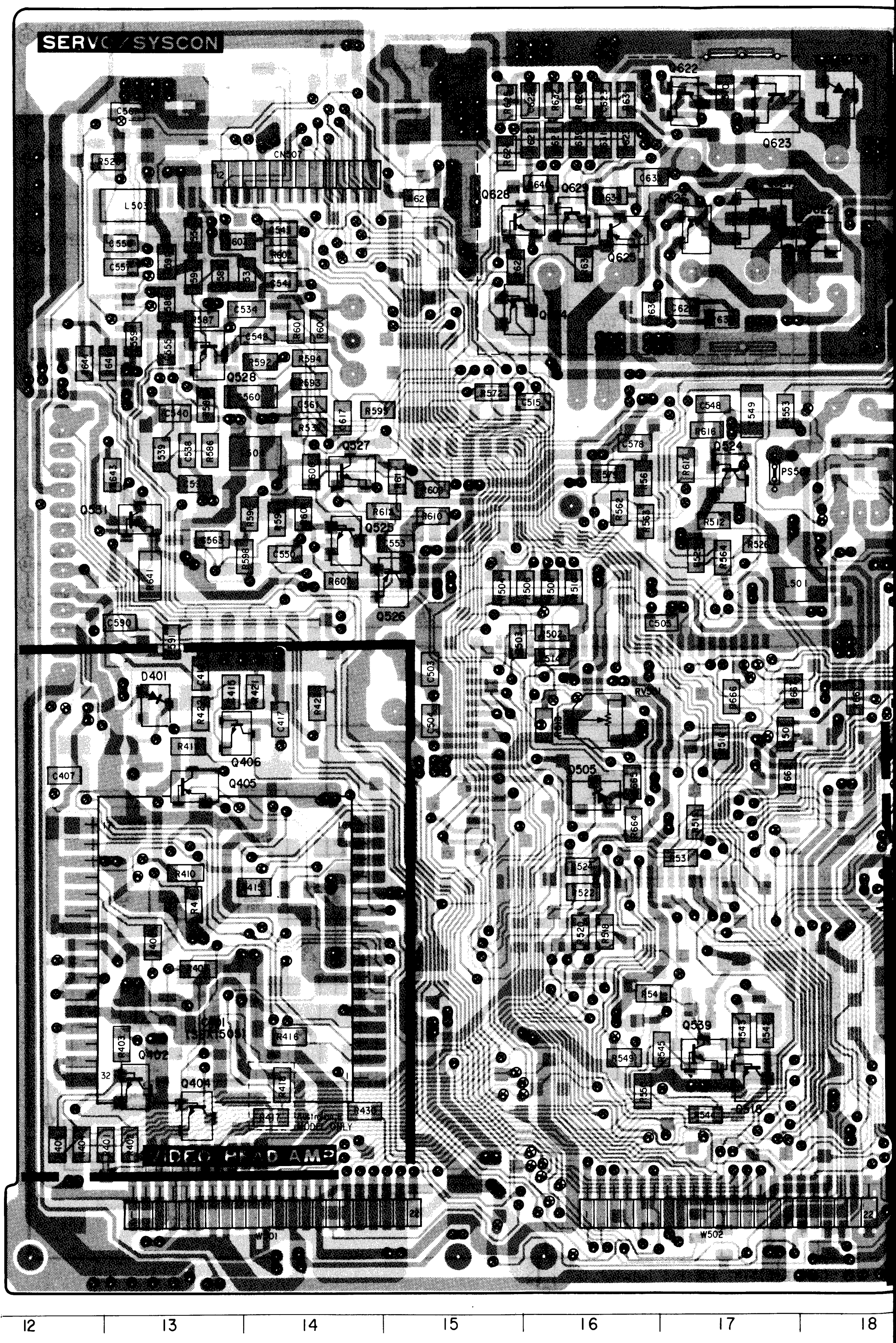
CO-2P (HEAD AMP, AUDIO/SERVO, SYSTEM CONTROL), CC-26P (TFG/SFG AMP), KS-6P (CAPSTAN MOTOR DRIVE JUNCTION), FP-89 (TAPE END SENSOR), FP-90 (TAPE TOP SENSOR) PRINTED WIRING BOARDS

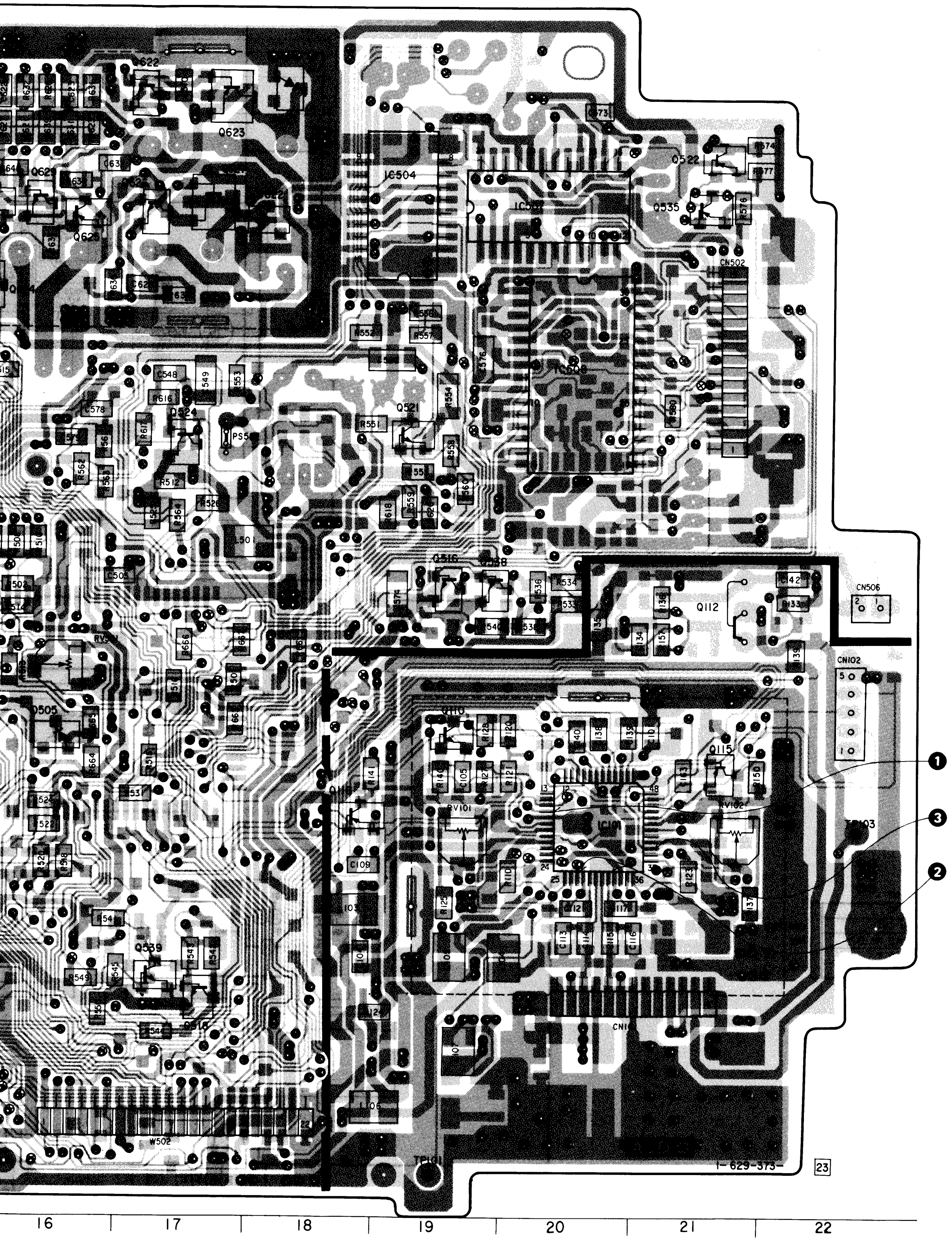
— Ref. No. CO-2P, FP-89 BOARDS: 6000 series, CC-26PBOARD: 7000 series, FP-90, KS-6P BOARDS: 8000 series —

CO-2PBOARD (COMPONENT SIDE)

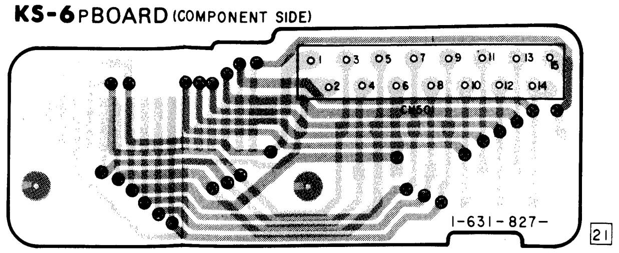

A
B
C
D
E
F
G
H
I
SERVO/SYSCON
AUDIO
VIDEO HEAD AMP
IC501
IC502
IC505
IC506
IC621
IC401
X501
X502
CN501
CN505
RV551
RV621
Q520
Q621
Q623
Q536
Q537
Q530
Q532
Q533
Q534
Q540
Q401
Q403
Q109
Q107
L621
L622
L623
1-629-373-
23
1
2
3
4
5
6
7
8
9
10
11

CO-2PBOARD (CONDUCTOR SIDE)

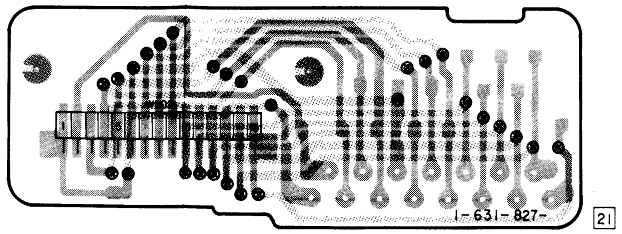

SERVO/SYSCON
VIDEO HEAD AMP
CN501
W501
W502
Q622
Q623
Q626
Q627
Q528
Q531
Q524
Q525
Q526
Q505
Q539
Q404
Q405
Q406
D401
L501
L503
12
13
14
15
16
17
18


Q622
Q623
IC504
CN502
IC508
Q521
Q522
Q535
L501
Q516
Q112
CN506
CN102
Q110
Q115
IC101
RV101
RV102
TP103
TP101
CN101
W502
Q539
1-629-373-
23
❶
❸
❷
16
17
18
19
20
21
22

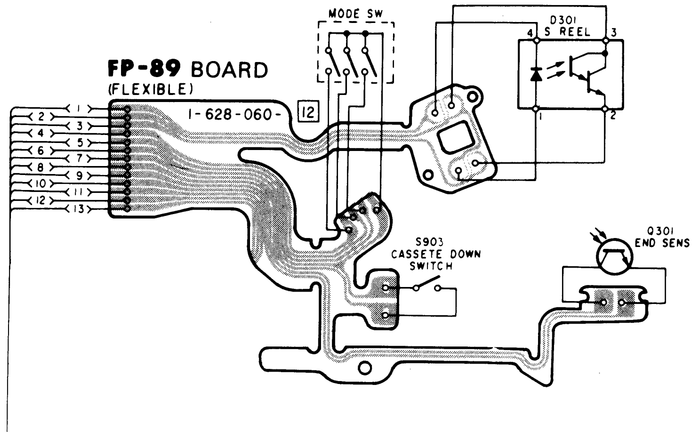
KS-6 P BOARD (COMPONENT SIDE)


01
03
05
07
09
011
013
02
04
06
08
010
012
014
1-631-827-
21

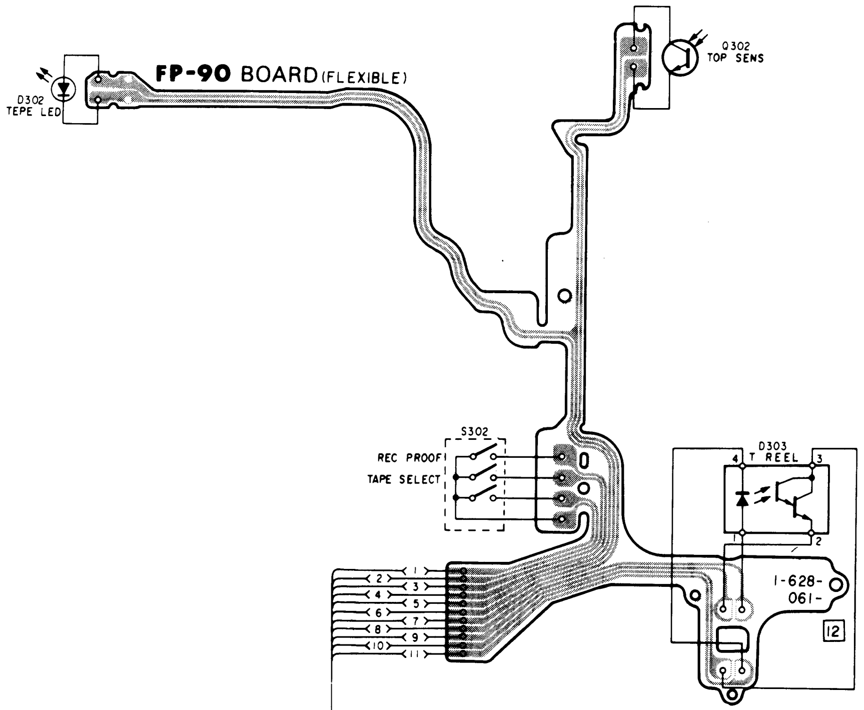
KS-6 P BOARD (CONDUCTOR SIDE)



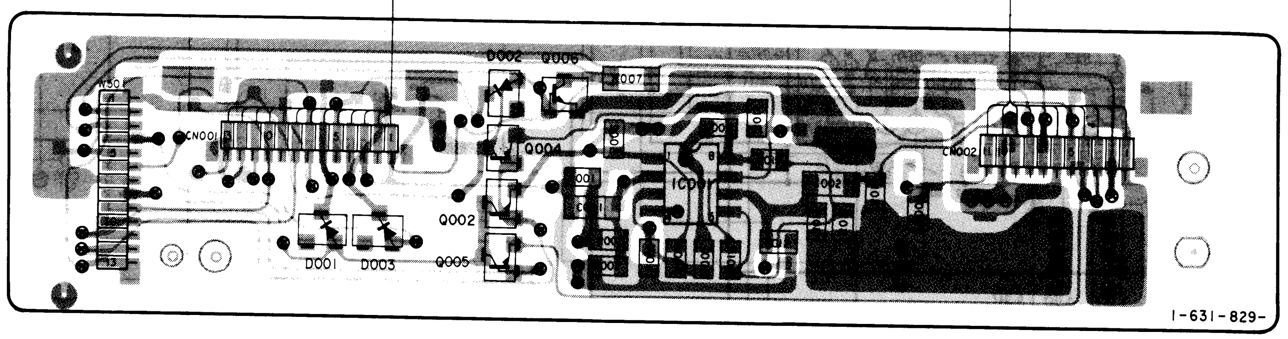
FP-89 BOARD (FLEXIBLE)


MODE SW
D301 S REEL
1-628-060-
12
S903 CASSETE DOWN SWITCH
Q301 END SENS
1
2
3
4
5
6
7
8
9
10
11
12
13

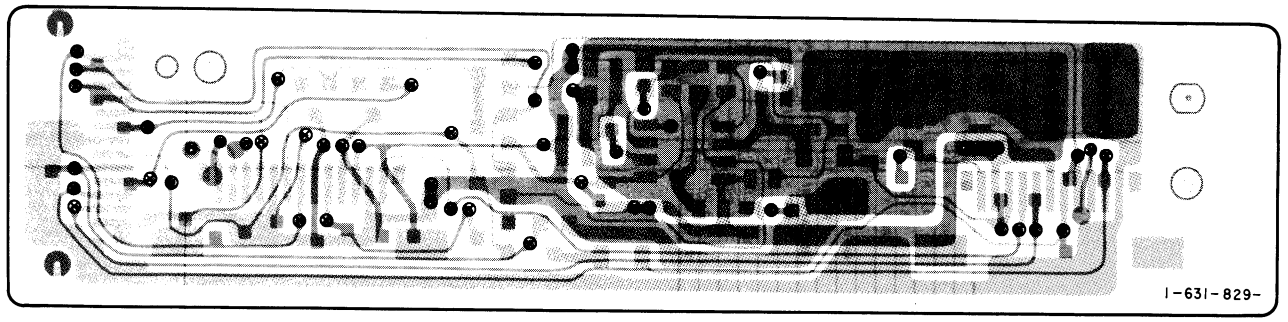
FP-90 BOARD (FLEXIBLE)


D302 TEPE LED
Q302 TOP SENS
S302
REC PROOF
TAPE SELECT
D303 T REEL
1-628-061-
12
1
2
3
4
5
6
7
8
9
10
11

CC-26 P BOARD (COMPONENT SIDE)

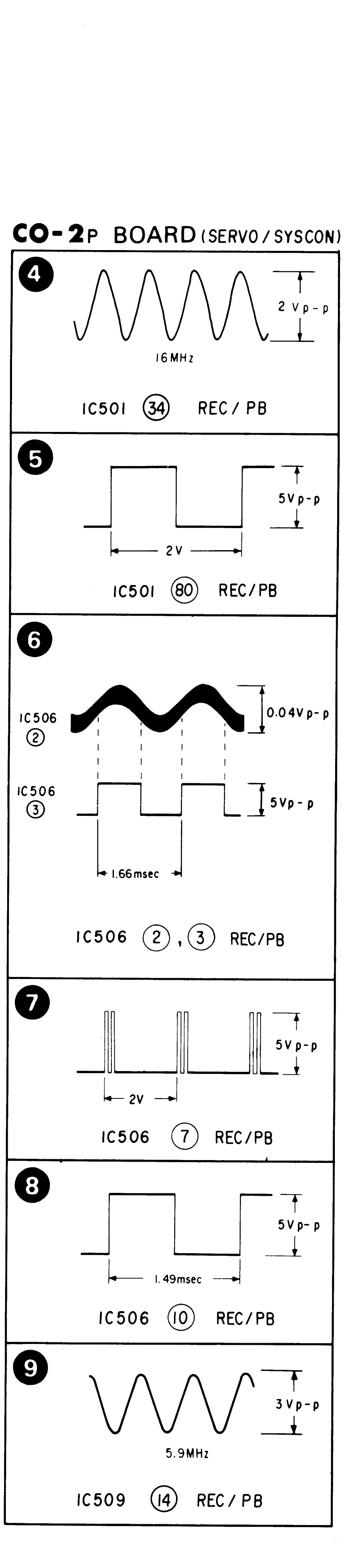

CN001
CN002
D002
Q006
Q007
Q004
IC001
Q002
Q005
D001
D003
1-631-829-

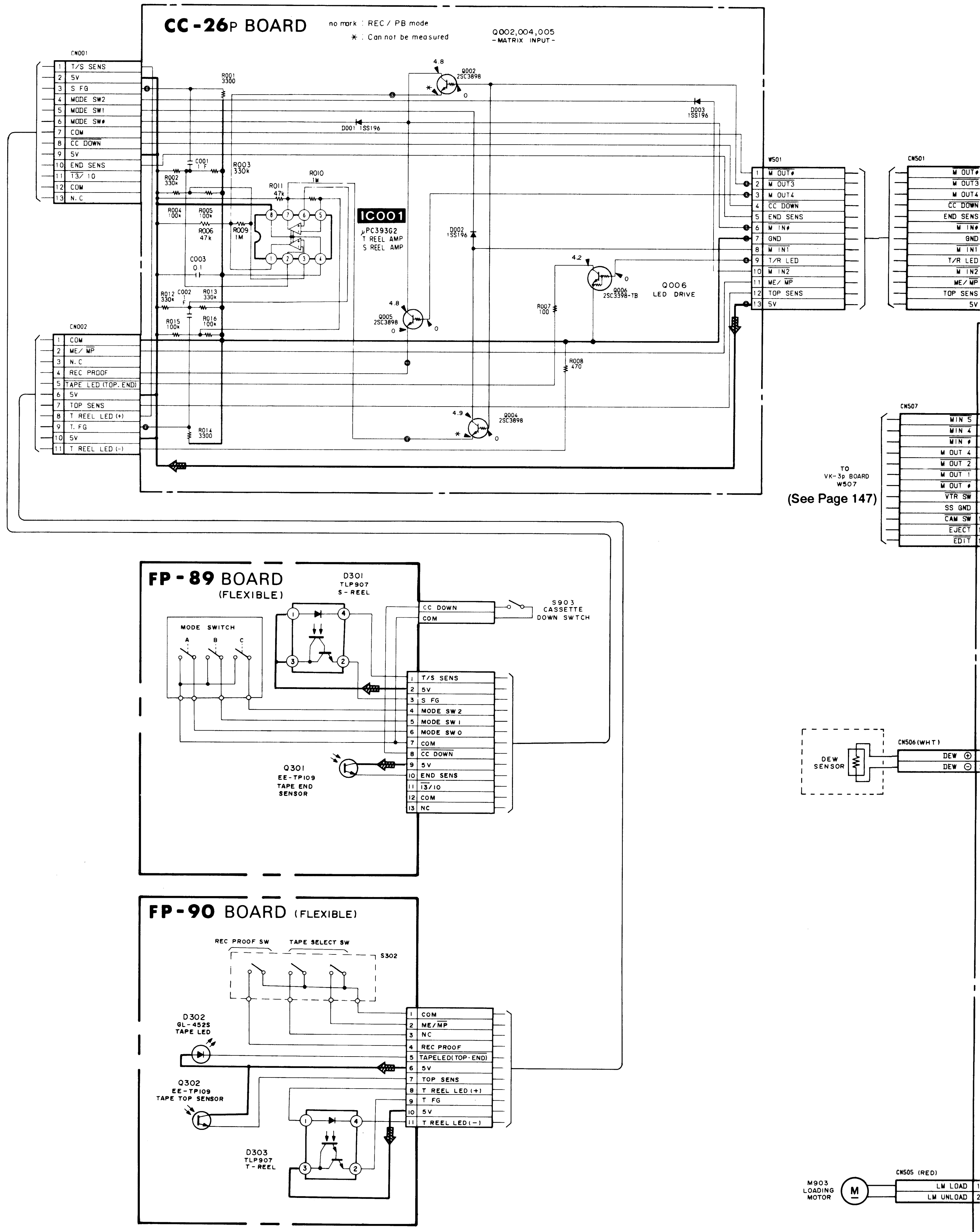
CC-26 P BOARD (CONDUCTOR SIDE)

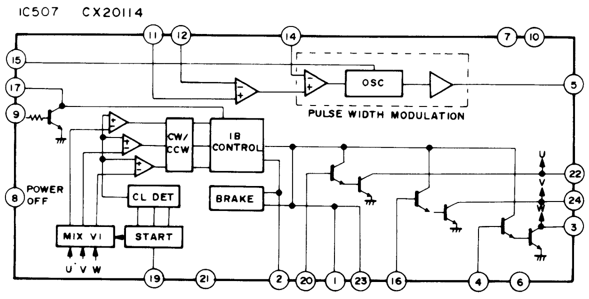


— Ref. No. CO-2P, FP-89 BOARDS: 6000 series, CC-26PBOARD: 7000 series, FP-90, KS-6P BOARDS: 8000 series —

CO-2P BOARD (SERVO/SYSCON)




CC-26P BOARD
no mark : REC / PB mode
* : Can not be measured
Q002,004,005 -MATRIX INPUT-
CN001
T/S SENS
5V
S FG
MODE SW2
MODE SW1
MODE SW0
COM
CC DOWN
END SENS
13/10
N.C
IC001
μPC393G2
T REEL AMP
S REEL AMP
Q002 2SC3898
Q003 1SS196
D001 1SS196
D002 1SS196
Q005 2SC3898
Q006 2SC3398-TB
Q006 LED DRIVE
Q004 2SC3898
CN002
ME/MP
REC PROOF
TAPE LED (TOP. END)
TOP SENS
T REEL LED (+)
T. FG
T REEL LED (-)
W501
M OUT0
M OUT3
M OUT4
M IN0
GND
M IN1
T/R LED
M IN2
CN501
CN507
TO VK-3P BOARD W507
(See Page 147)
FP-89 BOARD (FLEXIBLE)
D301 TLP907 S-REEL
MODE SWITCH
S903 CASSETTE DOWN SWTCH
Q301 EE-TP109 TAPE END SENSOR
FP-90 BOARD (FLEXIBLE)
REC PROOF SW
TAPE SELECT SW
S302
D302 GL-452S TAPE LED
Q302 EE-TP109 TAPE TOP SENSOR
D303 TLP907 T-REEL
DEW SENSOR
CN506 (WHT)
DEW ⊕
DEW ⊖
M903 LOADING MOTOR
CN505 (RED)
LM LOAD
LM UNLOAD


IC507 CX20114
OSC
PULSE WIDTH MODULATION
CW/CCW
1B CONTROL
CL DET
BRAKE
MIX VI
START
POWER OFF
U V W

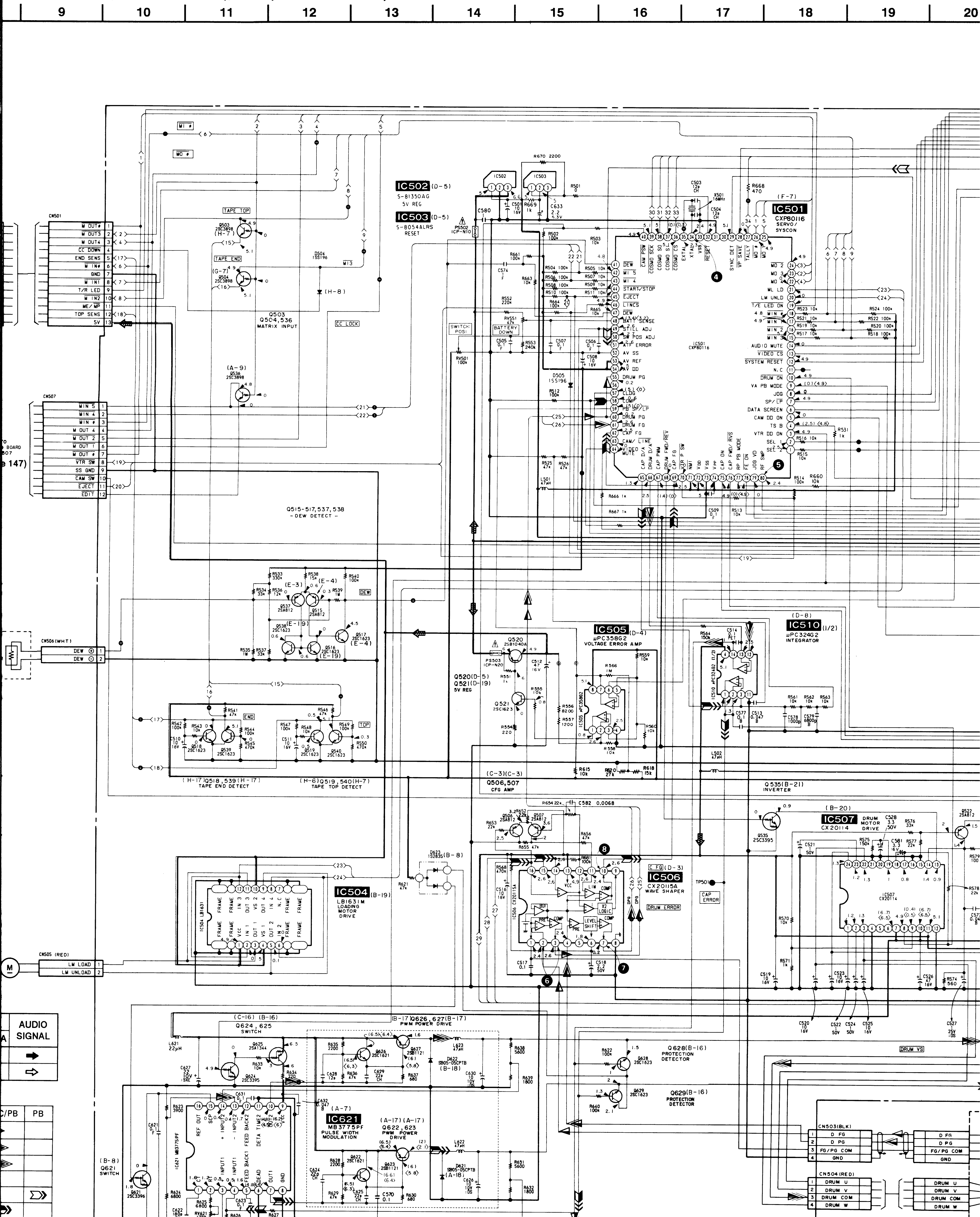
- **SIGNAL PATH**

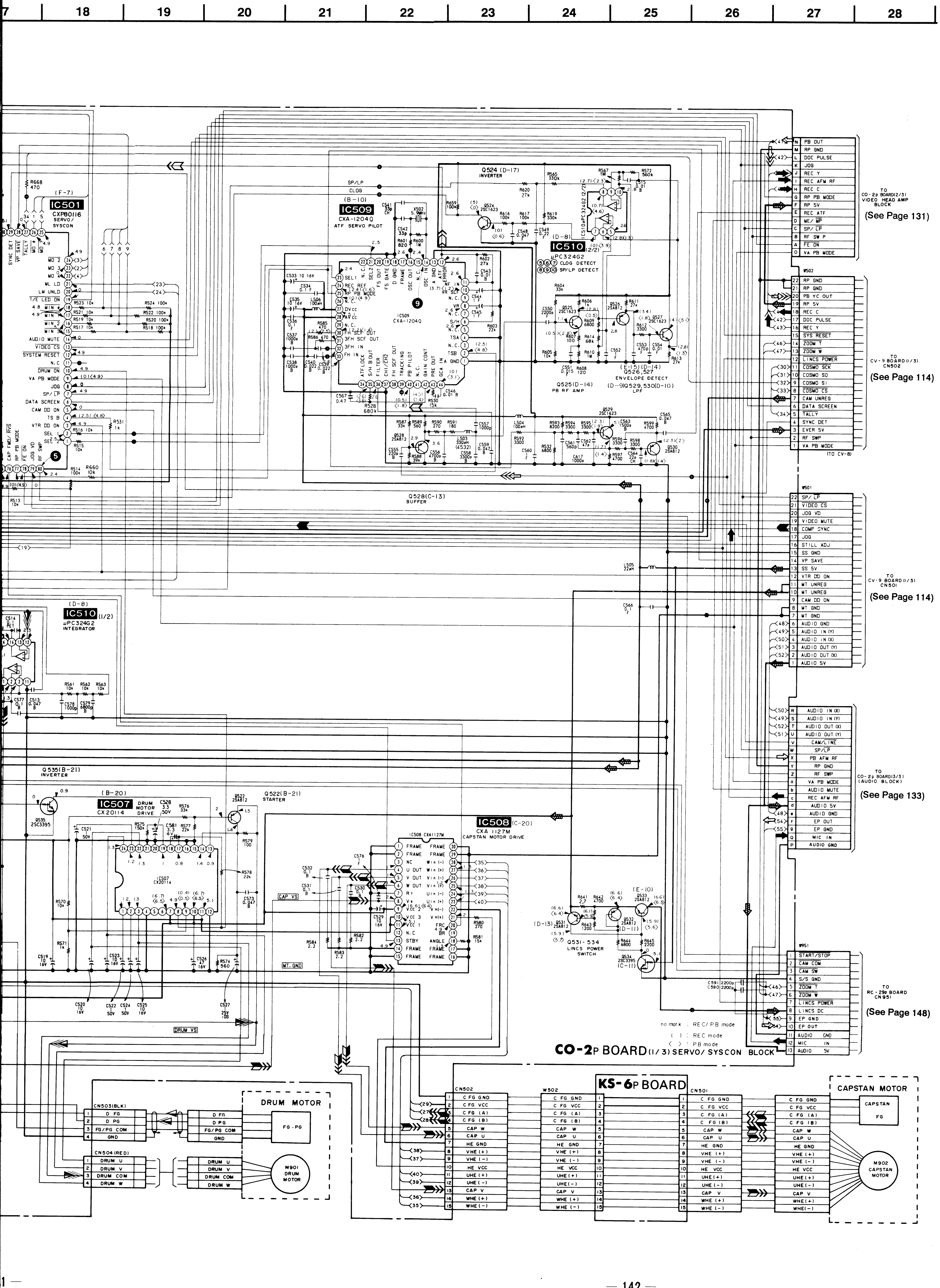
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡		➡≫	➡
PB			⇨≫	⇨

- Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷>	
Drum servo (speed and phase)		▷≫	
Capstan speed servo			
Capstan phase servo			⊃»
Capstan servo (speed and phase)		➤»	
Ref. signal	➤		⊃

JUNCTION), FP-89 (TAPE END SENSOR), FP-90 (TAPE TOP SENSOR) SCHEMATIC DIAGRAMS

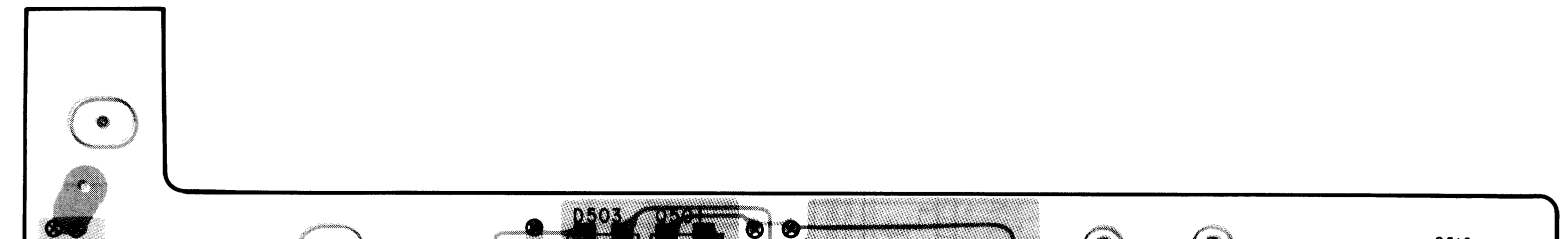

9
10
11
12
13
14
15
16
17
18
19
20
CN501
M OUT# 1
M OUT3 2
M OUT4 3
CC DOWN 4
END SENS 5
M IN# 6
GND 7
M IN1 8
T/R LED 9
M IN2 10
ME/MP 11
TOP SENS 12
5V 13
CN507
MIN 5 1
MIN 4 2
MIN # 3
M OUT 4 4
M OUT 2 5
M OUT 1 6
M OUT # 7
VTR SW 8
SS GND 9
CAM SW 10
EJECT 11
EDIT 12
TAPE TOP
Q503 2SC3898 (H-7)
TAPE END
Q504 2SC3898 (G-7)
D504 1SS196
M13
Q503 Q504,536 MATRIX INPUT
CC LOCK
(A-9) Q536 2SC3898
Q515-517,537,538 -DEW DETECT-
CN506(WHT)
DEW ⊕ 1
DEW ⊖ 2
Q537 2SA812
Q515 2SA812
Q538 2SC1623
Q516 2SC1623
Q517 2SC1623
DEW
END
TOP
Q518 2SC1623
Q539 2SC1623
Q519 2SC1623
Q540 2SC1623
(H-17)Q518,539(H-17) TAPE END DETECT
(H-6)Q519,540(H-7) TAPE TOP DETECT
IC502 (D-5) S-81350AG 5V REG
IC503 (D-5) S-8054ALRS RESET
PS502 ICP-N10
SWITCH POSI
BATTERY DOWN
RV501 100k
RV551 47k
D505 1SS196
IC501 CXP80116 SERVO/SYSCON
X501 16MHz
DEW
MI 5
MI 4
START/STOP
EJECT
LINCS
BATT SENSE
STILL ADJ
SW POS ADJ
ATF ERROR
AV SS
AV REF
AV DD
DRUM PG
CLDG
PB SP/LP
DRUM FG
CAP FG
CAM/LINE
VIDEO MUTE
MO 2
MO 3
MO 4
ML LD
LM UNLD
T/E LED ON
MIN 4
MIN 1
MIN 2
MIN 3
AUDIO MUTE
VIDEO CS
SYSTEM RESET
N.C
DRUM ON
VA PB MODE
JOG
SP/LP
DATA SCREEN
CAM DD ON
TS B
VTR DD ON
SEL 1
SEL 2
RESET
SYNC DET
VP SAVE
TALLY
CAP D/A
DRUM D/A
CAP PWM
DRUM FWD/REV
VTR P SW
CAP ON
CAP FWD/RVS
RP PB MODE
FE ON
JOG VD
RF SW
Q520 2SB1040A
PS503 ICP-N20
Q521 2SC1623
Q520(D-5) Q521(D-19) 5V REG
IC505 (D-4) μPC358G2 VOLTAGE ERROR AMP
IC510 (1/2) (D-8) μPC324G2 INTEGRATOR
(C-3)(C-3) Q506,507 CFG AMP
Q535(B-21) INVERTER
Q535 2SC3395
IC507 (B-20) CX20114 DRUM MOTOR DRIVE
Q506 2SA812
Q507 2SA812
IC506 (D-3) CX20115A WAVE SHAPER
C FG
DRUM ERROR
CAP ERROR
TP501
IC504 (B-19) LB1631M LOADING MOTOR DRIVE
D623 1S2835(B-8)
CN505 (RED)
LM LOAD 1
LM UNLOAD 2
(C-16) (B-16) Q624,625 SWITCH
Q625 2SA1344
Q624 2SC3395
(B-17)Q626,627(B-17) PWM POWER DRIVE
Q626 2SC1621
Q627 2SB1121
D622 SB05-05CPTB (B-18)
IC621 MB3775PF PULSE WIDTH MODULATION
(A-17) (A-17) Q622,623 PWM POWER DRIVE
Q622 2SC1621
Q623 2SB1121
D621 SB05-05CPTB (A-18)
(B-8) Q621 SWITCH
Q621 2SC3396
FREQUENCY
Q628(B-16) PROTECTION DETECTOR
Q629(B-16) PROTECTION DETECTOR
Q628 2SC1623
Q629 2SC1623
DRUM VS
CN503(BLK)
D FG 1
D PG 2
FG/PG COM 3
GND 4
CN504 (RED)
DRUM U 1
DRUM V 2
DRUM COM 3
DRUM W 4
AUDIO SIGNAL
C/PB
PB


18
19
20
21
22
23
24
25
26
27
28
IC501 (F-7) CXP80116 SERVO/SYSCON
IC509 (B-10) CXA-1204Q ATF SERVO PILOT
Q524 (D-17) INVERTER
IC510 (D-8) μPC324G2 (2/2)
⑤⑥⑦ CLOG DETECT
⑧⑨⑩ SP/LP DETECT
Q525 (D-14) PB RF AMP
Q526,527 (E-15)(D-14) ENVELOPE DETECT
(D-9) Q529,530 (D-10) LPF
Q528 (C-13) BUFFER
IC510 (D-8) (1/2) μPC324G2 INTEGRATOR
Q535 (B-21) INVERTER
IC507 (B-20) CX20114 DRUM MOTOR DRIVE
Q522 (B-21) STARTER
IC508 (C-20) CXA1127M CAPSTAN MOTOR DRIVE
Q531-534 LINCS POWER SWITCH
TO CO-2P BOARD (2/3) VIDEO HEAD AMP BLOCK
(See Page 131)
TO CV-9 BOARD (1/3) CN502
(See Page 114)
TO CV-9 BOARD (1/3) CN501
(See Page 114)
TO CO-2P BOARD (3/3) (AUDIO BLOCK)
(See Page 133)
TO RC-29P BOARD CN951
(See Page 148)
no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
CO-2P BOARD (1/3) SERVO/SYSCON BLOCK
KS-6P BOARD
DRUM MOTOR
M901 DRUM MOTOR
CAPSTAN MOTOR
M902 CAPSTAN MOTOR
CN503 (BLK)
CN504 (RED)
CN502
W502
CN501
CAP VS
MT. GND
DRUM VS

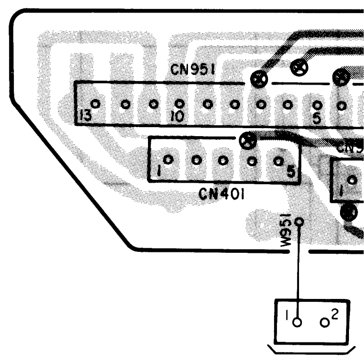
MA-37P (MIC AMP), RC-29P (START/STOP SWITCH), VK-3P (VIDEO FUNCTION SWITCH) PRINTED WIRING BOARDS

— Ref. No. MA-37P, VK-3P BOARDS: 9000 series, RC-29P BOARD: 10000 series —

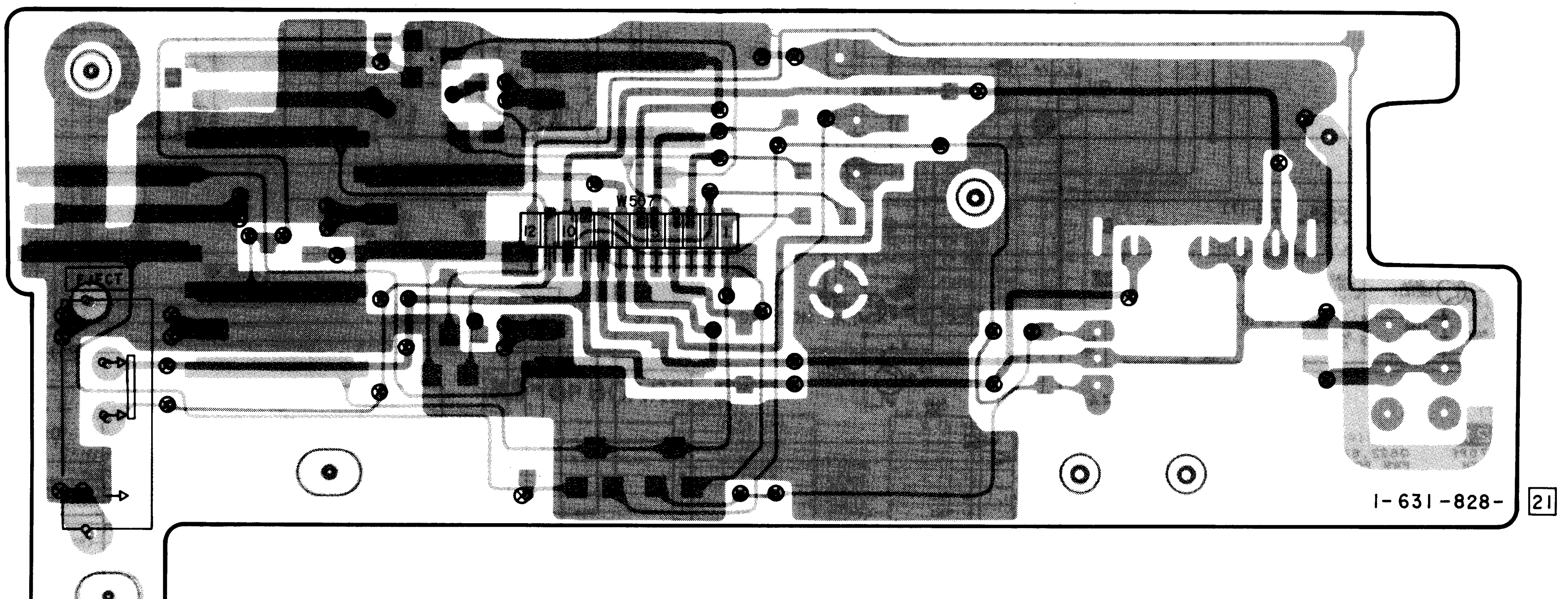
VK-3P BOARD (COMPONENT SIDE)


D503
Q501
S502
REW ◀◀
S506
D502
S505
S503
Q502
AEP, UK MODEL ONLY
D505
D504
S504
FF ▶▶
D501
S509
DATA SCREEN
S507
● REC
CN508
1
2
3
Australian, E MODEL
AEP, UK MODEL
POWER
PLAYER
VTR
S501
OFF
CAMERA
S510
EDIT
ON
1-631-828-
21
Australian, E MODEL ONLY

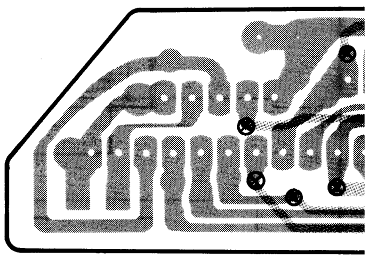
RC-29P BOARD (COMPONEN


CN951
13
10
5
CN401
1
5
W951
1
2
TO CV-9 BOA
CN902

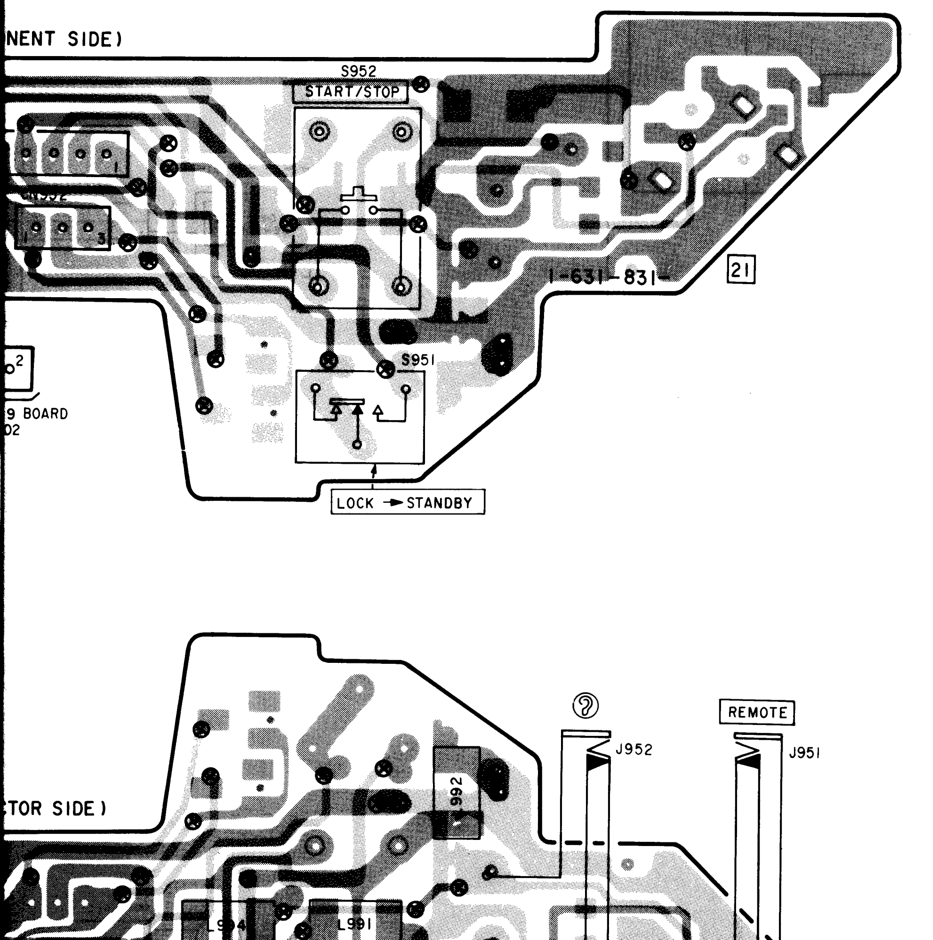
VK-3P BOARD (CONDUCTOR SIDE)


W507
EJECT
1-631-828-
21

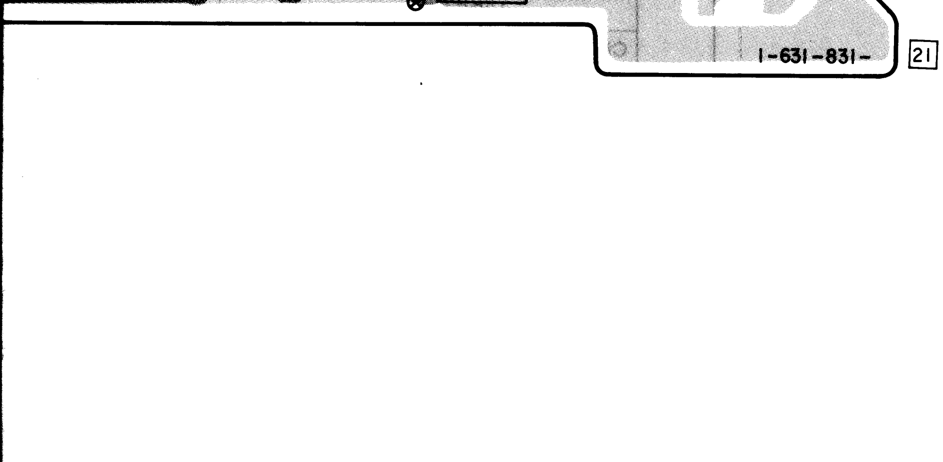
RC-29 P BOARD (CONDUCTOR



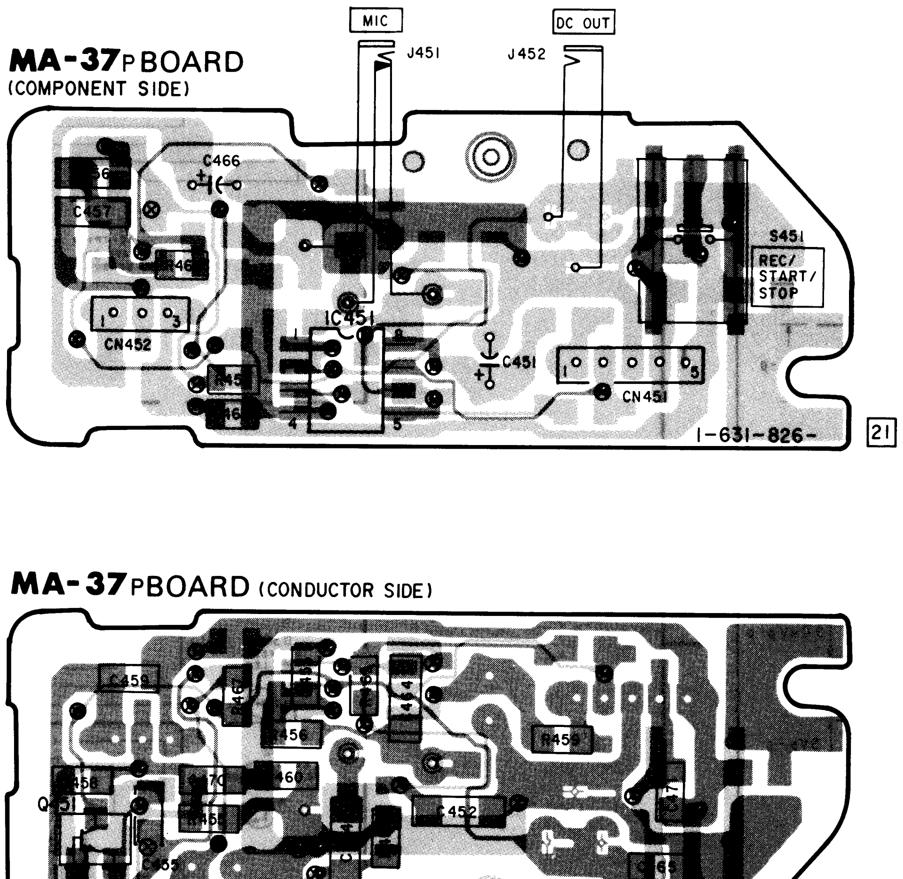
NENT SIDE)


S952
START/STOP
1-631-831-
21
S951
9 BOARD
02
LOCK → STANDBY

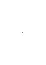
TOR SIDE)


⑦
J952
REMOTE
J951
L992
L994
L991
L993
L995
1-631-831-
21

MA-37P BOARD
(COMPONENT SIDE)

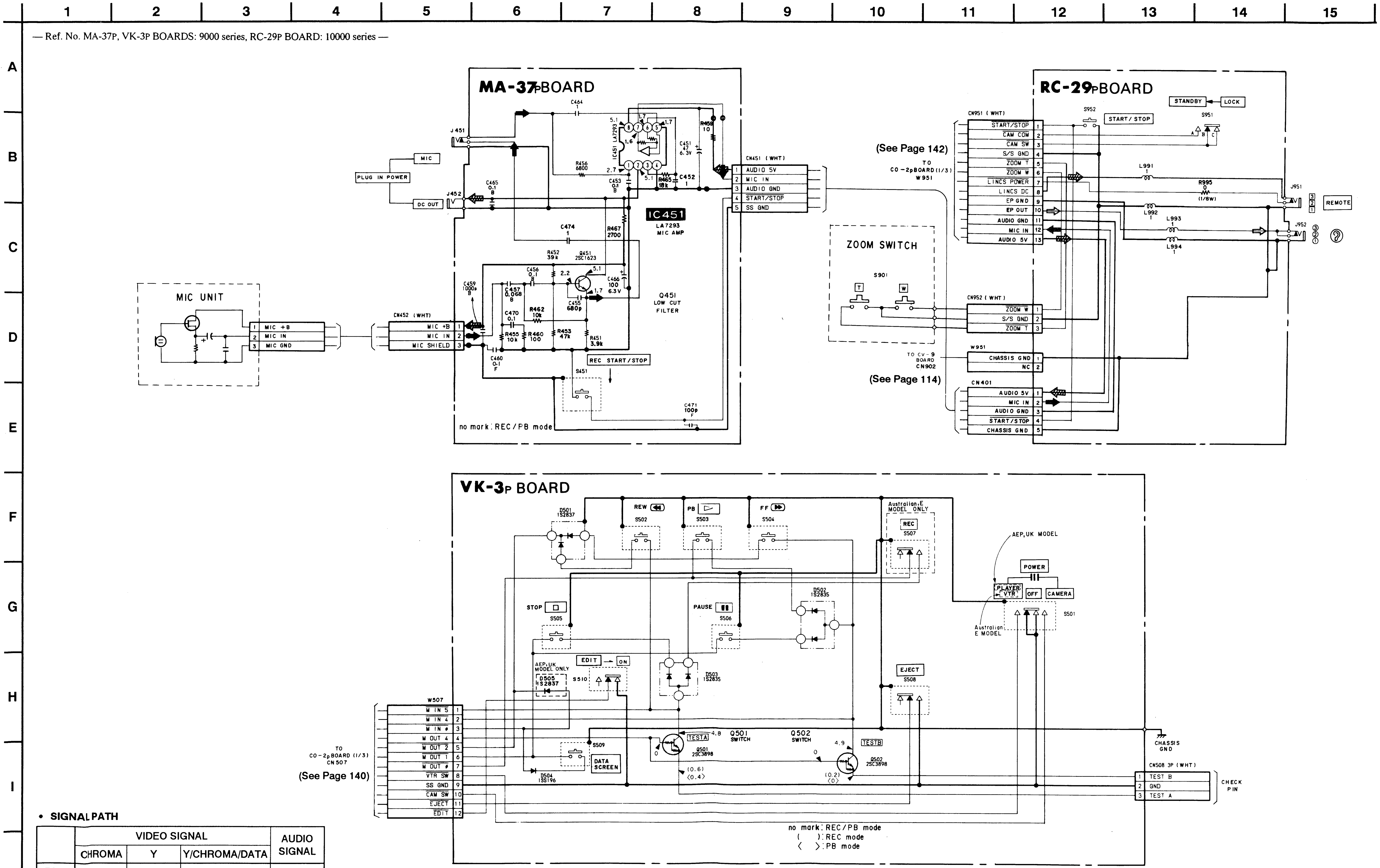

MIC
J451
DC OUT
J452
C466
C457
IC451
CN452
C451
CN451
S451
REC/
START/
STOP
1-631-826-
21

MA-37P BOARD (CONDUCTOR SIDE)


C459
C456
R459
C452
Q451
1-631-826-
21

MA-37P (MIC AMP), RC-29P (START/STOP SWITCH), VK-3P (VIDEO FUNCTION SWITCH) SCHEMATIC DIAGRAMS

— Ref. No. MA-37P, VK-3P BOARDS: 9000 series, RC-29P BOARD: 10000 series —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11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
MA-37P BOARD
MIC UNIT
MIC +B
MIC IN
MIC GND
CN452 (WHT)
MIC SHIELD
J451
J452
MIC
PLUG IN POWER
DC OUT
IC451
LA7293
MIC AMP
Q451
2SC1623
Q451
LOW CUT FILTER
REC START/STOP
S451
CN451 (WHT)
AUDIO 5V
MIC IN
AUDIO GND
START/STOP
SS GND
no mark: REC/PB mode
RC-29P BOARD
STANDBY
LOCK
START/STOP
S952
S951
CN951 (WHT)
CAM COM
CAM SW
S/S GND
ZOOM T
ZOOM W
LINCS POWER
LINCS DC
EP GND
EP OUT
AUDIO GND
MIC IN
AUDIO 5V
(See Page 142)
TO CO-2P BOARD (1/3) W951
L991
L992
L993
L994
R995
J951
J952
REMOTE
ZOOM SWITCH
S901
T
W
CN952 (WHT)
W951
CHASSIS GND
NC
TO CV-9 BOARD CN902
(See Page 114)
CN401
CHASSIS GND
VK-3P BOARD
D501 1S2837
REW
PB
FF
S502
S503
S504
Australian, E MODEL ONLY
REC
S507
AEP, UK MODEL
POWER
PLAYER VTR
OFF
CAMERA
S501
Australian, E MODEL
STOP
S505
PAUSE
S506
D502 1S2835
EDIT
ON
AEP, UK MODEL ONLY
D505 1S2837
S510
D503 1S2835
EJECT
S508
W507
M IN 5
M IN 4
M IN 3
M OUT 4
M OUT 2
M OUT 1
M OUT 3
VTR SW
SS GND
CAM SW
EJECT
EDIT
TO CO-2P BOARD (1/3) CN507
(See Page 140)
S509
DATA SCREEN
D504 1SS196
TESTA
Q501 SWITCH
Q501 2SC3898
Q502 SWITCH
Q502 2SC3898
TESTB
CHASSIS GND
CN508 3P (WHT)
TEST B
GND
TEST A
CHECK PIN
no mark: REC/PB mode
( ): REC mode
〈 〉: PB mode

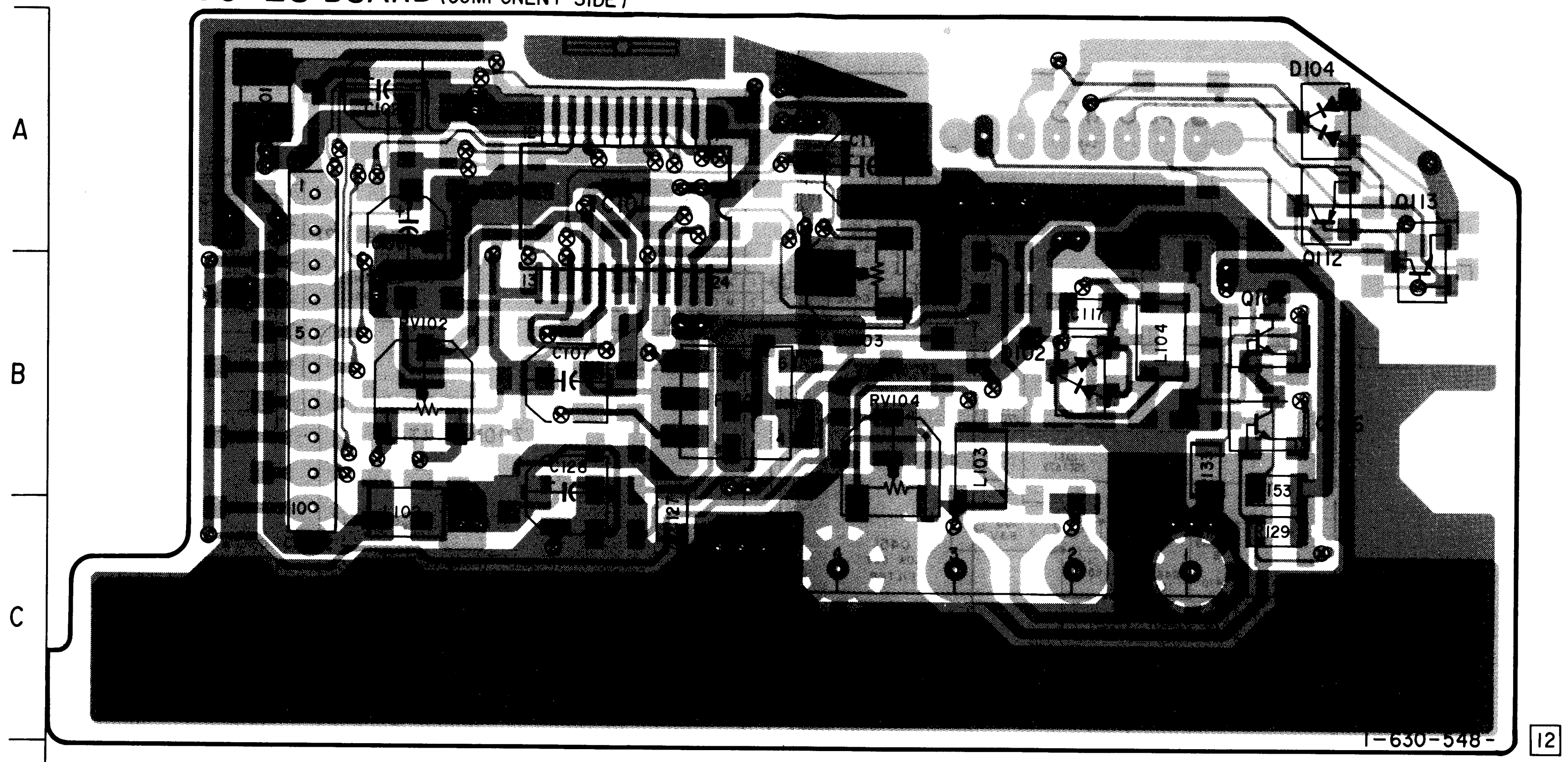
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC				➡
PB				⇨

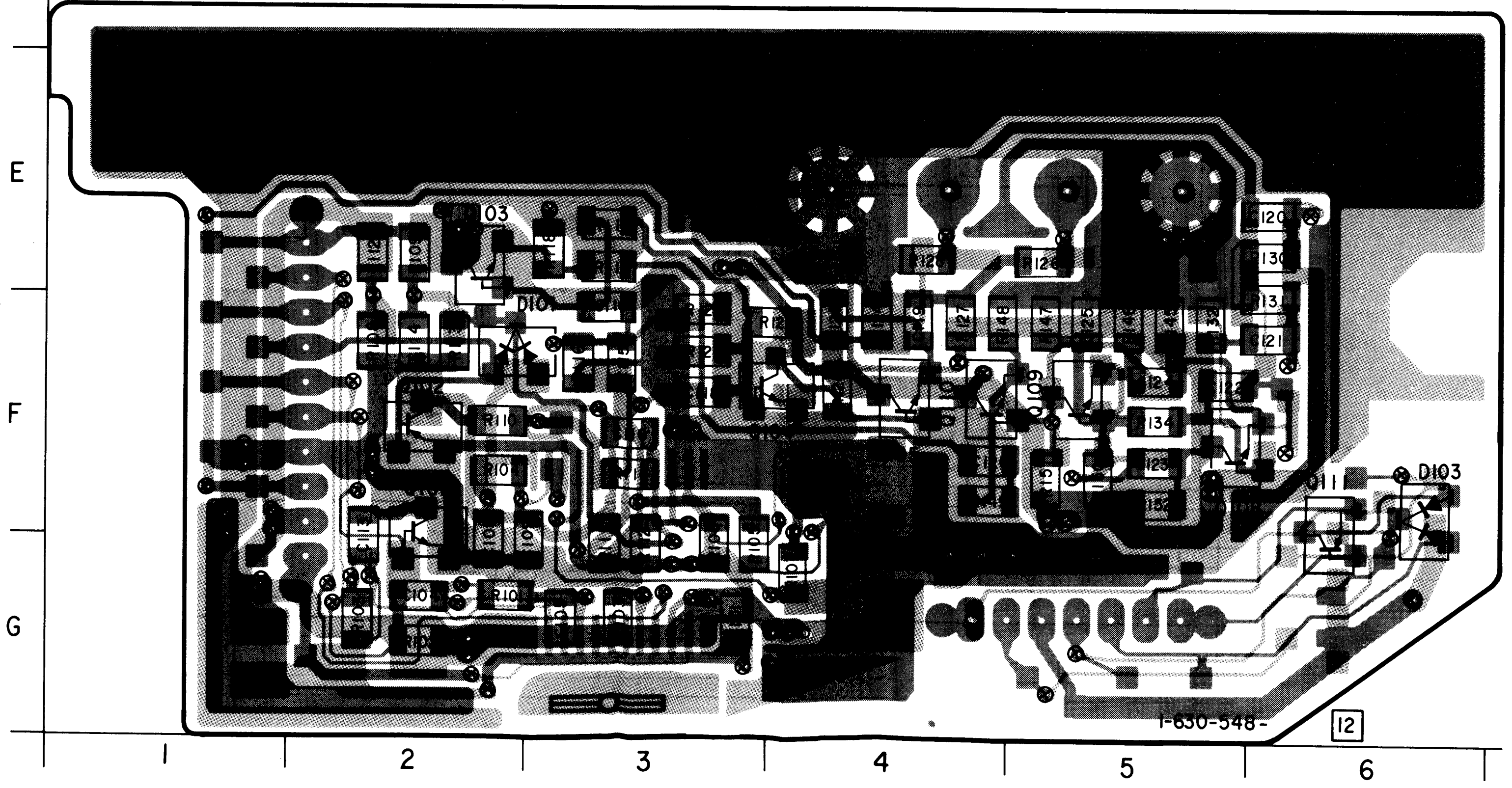
PJ-20 (JOG CHROMA PROCESS) PRINTED WIRING BOARD

— Ref. No. PJ-20 BOARD: 4000 series —

PJ-20 BOARD (COMPONENT SIDE)

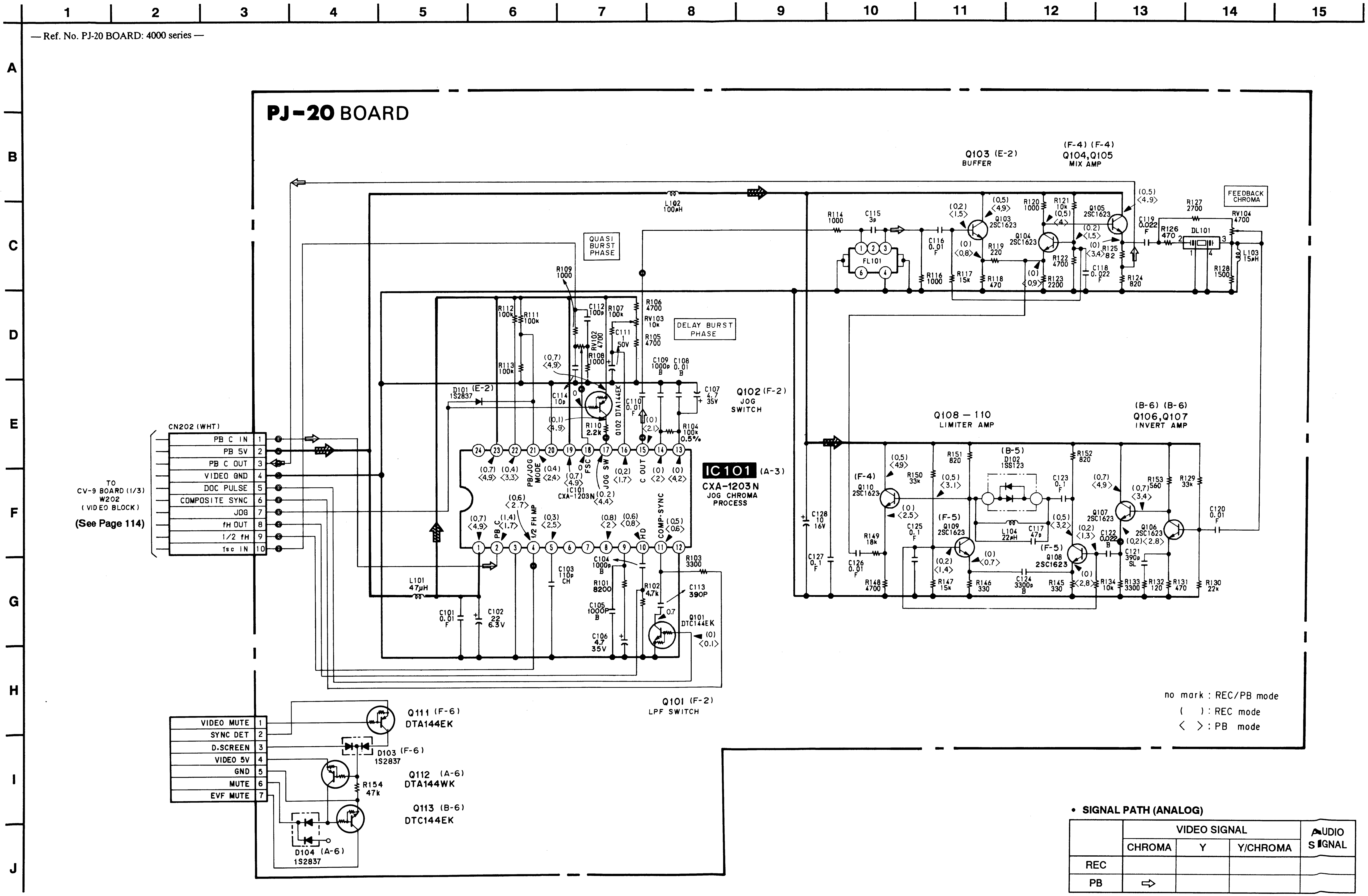

A
B
C
D104
Q113
Q112
RV102
C107
C128
RV104
L103
L104
1-630-548-
12

PJ-20 BOARD (CONDUCTOR SIDE)


D
E
F
G
D101
D103
R110
1-630-548-
12
1
2
3
4
5
6

PJ-20 (JOG CHROMA PROCESS) SCHEMATIC DIAGRAM

— Ref. No. PJ-20 BOARD: 4000 series —


1
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11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
PJ-20 BOARD
CN202 (WHT)
PB C IN 1
PB 5V 2
PB C OUT 3
VIDEO GND 4
DOC PULSE 5
COMPOSITE SYNC 6
JOG 7
fH OUT 8
1/2 fH 9
fsc IN 10
TO CV-9 BOARD (1/3) W202 (VIDEO BLOCK)
(See Page 114)
VIDEO MUTE 1
SYNC DET 2
D.SCREEN 3
VIDEO 5V 4
GND 5
MUTE 6
EVF MUTE 7
IC101 (A-3)
CXA-1203N
JOG CHROMA PROCESS
QUASI BURST PHASE
DELAY BURST PHASE
FEEDBACK CHROMA
Q102 (F-2) JOG SWITCH
Q101 (F-2) LPF SWITCH
Q101 DTC144EK
Q102 DTA144EK
Q103 (E-2) BUFFER
(F-4) (F-4) Q104,Q105 MIX AMP
Q108 – 110 LIMITER AMP
(B-6) (B-6) Q106,Q107 INVERT AMP
Q111 (F-6) DTA144EK
Q112 (A-6) DTA144WK
Q113 (B-6) DTC144EK
D101 (E-2) 1S2837
D102 1SS123
D103 (F-6) 1S2837
D104 (A-6) 1S2837
L101 47μH
L102 100μH
L103 15μH
L104 22μH
FL101
DL101
RV102 4700
RV103 10k
RV104 4700
PB/JOG MODE
FSC
JOG SW
C OUT
PB C
1/2 FH MP
HD
COMP-SYNC

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

- **SIGNAL PATH (ANALOG)**

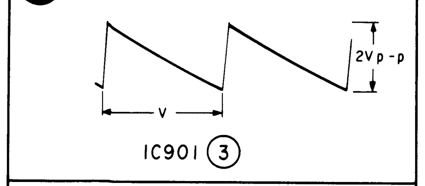
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB	⇨			

VF-14P (ELECTRONIC VIEW FIDER), LD-13P (TALLY LED) PRINTED WIRING BOARDS

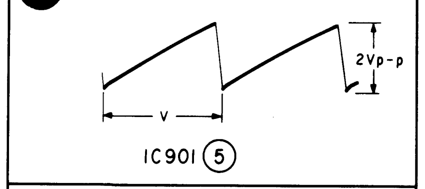
— Ref. No. VF-14P BOARD: 7000 series, LD-13P BOARD: 8000 series —

VF-14P BOARD

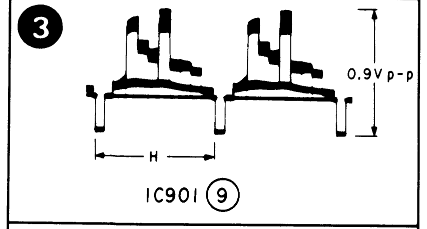
❶



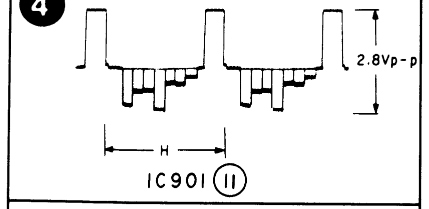
❷



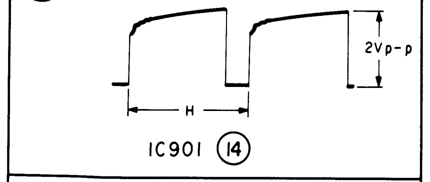
❸



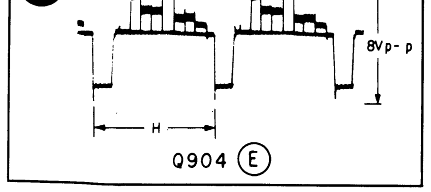
❹



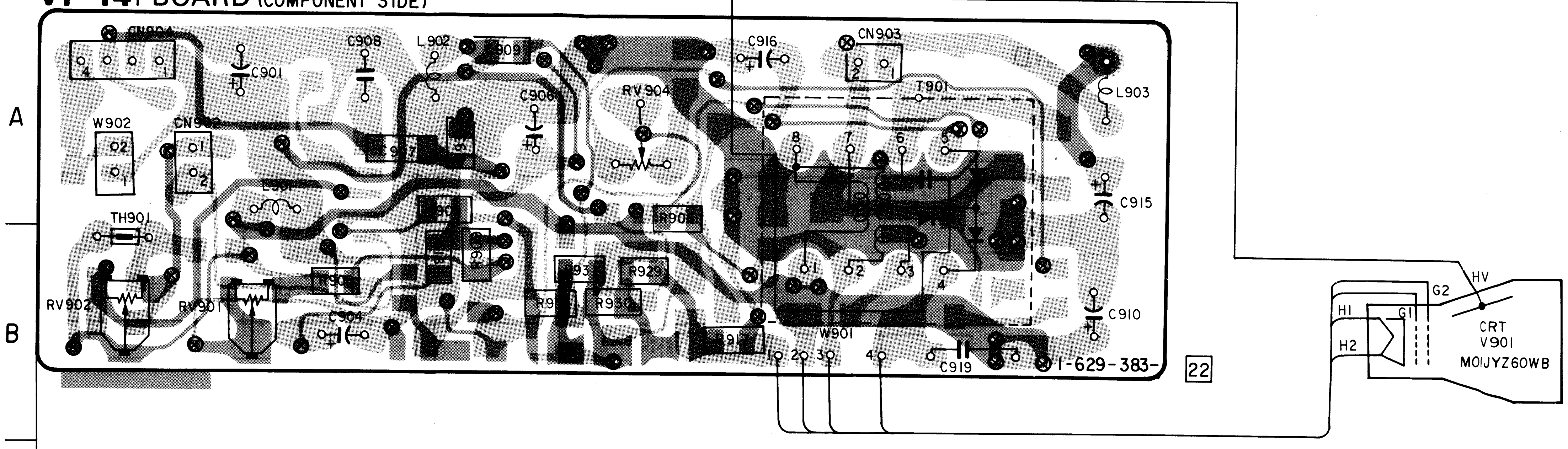
❺



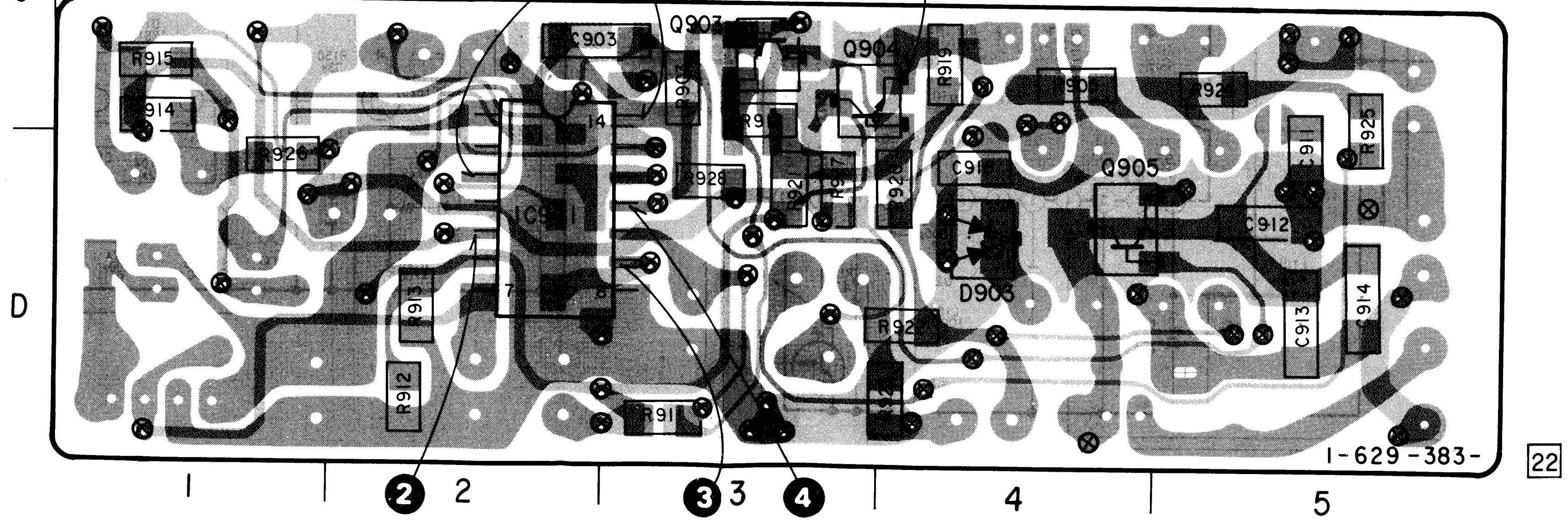
❻



VF-14P BOARD (COMPONENT SIDE)


A
B
CN904
C908
L902
C901
R909
C906
RV904
C916
CN903
T901
L903
W902
CN902
C907
L901
TH901
R901
R906
R929
R930
R931
C915
RV902
RV901
R908
C904
R911
W901
C910
C919
1-629-383-
22
HV
G2
H1
H2
G1
CRT
V901
M01JYZ60WB

VF-14P BOARD (CONDUCTOR SIDE)


C
D
❶
❺
❻
C903
Q903
Q904
R919
R915
R914
R926
IC901
14
7
8
R913
R912
R918
R928
R927
R924
R923
C911
Q905
D903
R925
C912
C913
C914
R921
1-629-383-
22
❷
❸
❹
1
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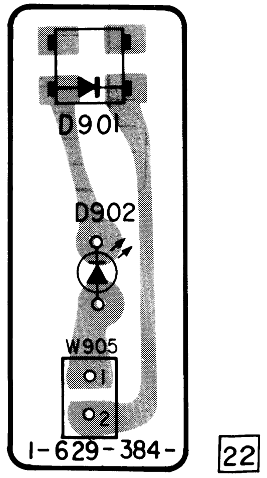
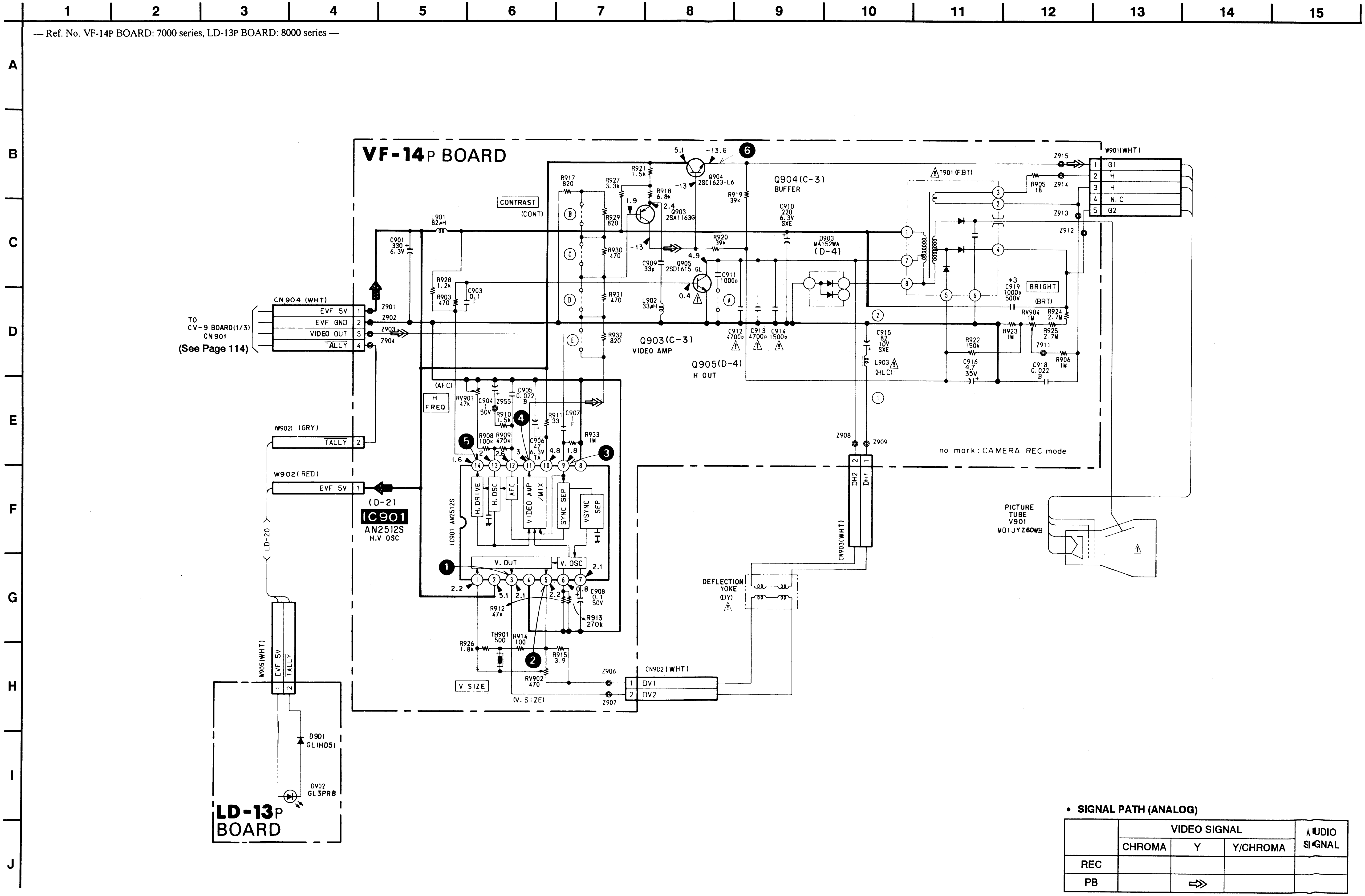
4
5

LD-13P BOARD


D901
D902
W905
1-629-384-
22

VF-14P (ELECTRONIC VIEW FIDER), LD-13P (TALLY LED) SCHEMATIC DIAGRAMS

— Ref. No. VF-14P BOARD: 7000 series, LD-13P BOARD: 8000 series —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14
15
A
B
C
D
E
F
G
H
I
J
VF-14P BOARD
CONTRAST
(CONT)
L901 82μH
C901 330 6.3V
R928 1.2k
R903 470
C903 0.1 F
R917 820
R927 3.3k
R929 820
R930 470
R931 470
R932 820
R921 1.5k
R918 6.8k
Q903 2SA1163G
Q904 2SC1623-L6
Q904(C-3) BUFFER
R919 39k
R920 39k
C909 33p
Q905 2SD1615-GL
C911 1000p
L902 33μH
Q903(C-3) VIDEO AMP
Q905(D-4) H OUT
C910 220 6.3V SXE
C912 4700p
C913 4700p
C914 1500p
D903 MA152WA (D-4)
C915 82 10V SXE
L903 (HLC)
T901 (FBT)
R905 18
Z915
Z914
Z913
Z912
W901(WHT)
G1
H
H
N.C
G2
*3 C919 1000p 500V
BRIGHT
(BRT)
RV904 1M
R924 2.7M
R923 1M
R925 2.7M
R922 150k
C916 4.7 35V
C918 0.022 B
R906 1M
Z911
no mark : CAMERA REC mode
Z908
Z909
CN903(WHT)
DH2
DH1
PICTURE TUBE V901 M01JYZ60WB
DEFLECTION YOKE (DY)
CN904 (WHT)
EVF 5V
EVF GND
VIDEO OUT
TALLY
Z901
Z902
Z903
Z904
TO CV-9 BOARD(1/3) CN901
(See Page 114)
(W902) (GRY)
TALLY
W902(RED)
EVF 5V
(D-2)
IC901
AN2512S
H.V OSC
IC901 AN2512S
(AFC)
H FREQ
RV901 47k
C904 1 50V
Z955
C905 0.022 B
R910 1.5k
R911 33
C907 1 F
R933 1M
R908 100k
R909 470k
C906 47 6.3V TA
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V.OUT
V.OSC
C908 0.1 50V
R913 270k
R912 47k
R926 1.8k
TH901 500
R914 100
R915 3.9
RV902 470
V SIZE
(V.SIZE)
Z906
Z907
CN902(WHT)
DV1
DV2
LD-20
W905(WHT)
EVF 5V
TALLY
D901 GL1HD51
D902 GL3PR8
LD-13P BOARD

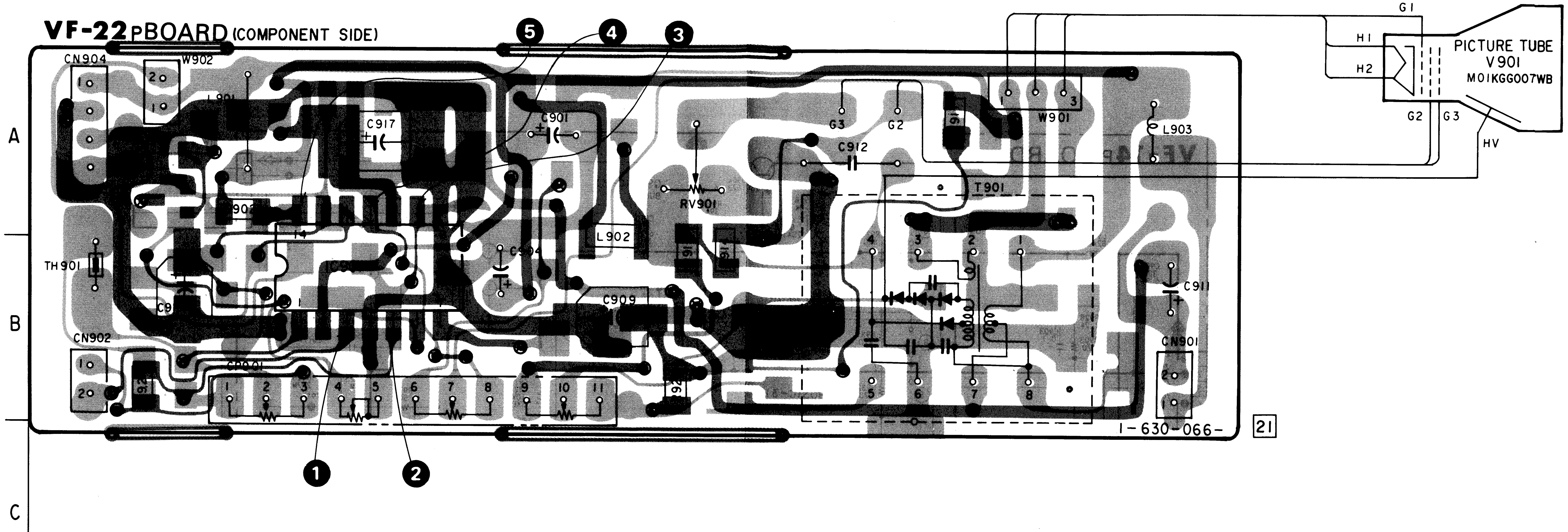
• **SIGNAL PATH (ANALOG)**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB		⇨		

VF-22P (ELECTRONIC VIEW FIDER), LD-17P (TALLY LED) PRINTED WIRING BOARDS

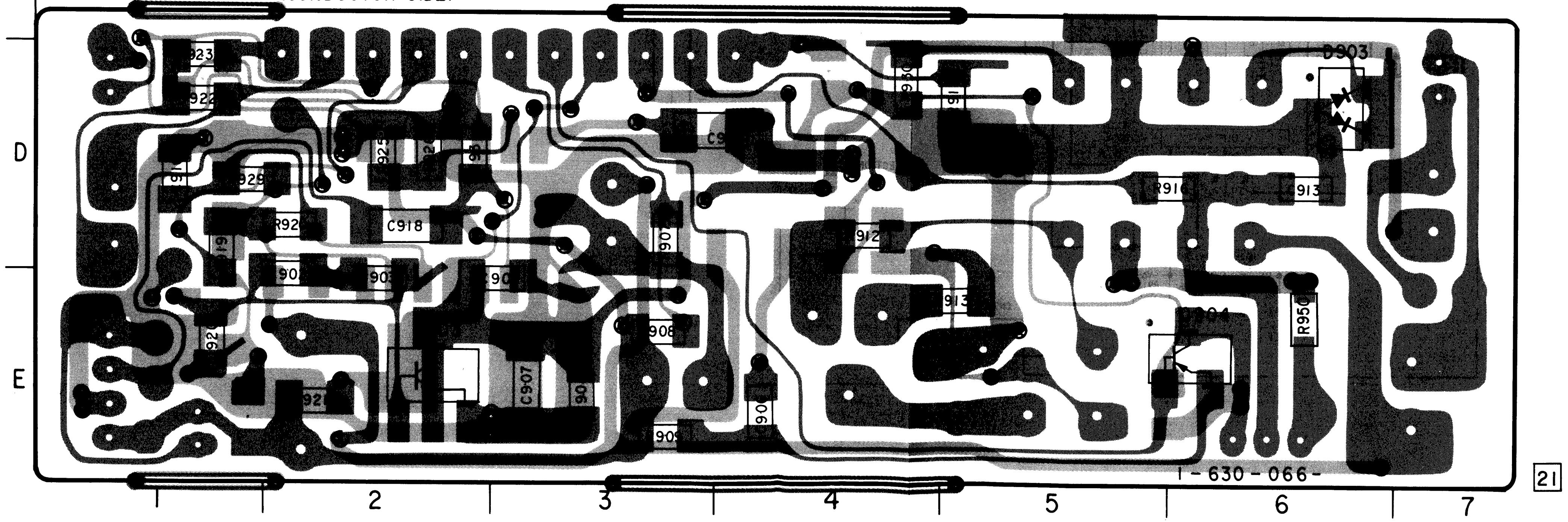
— Ref. No. VF-22P BOARD: 4000 series, LD-17P BOARD: 5000 series —

VF-22PBOARD (COMPONENT SIDE)



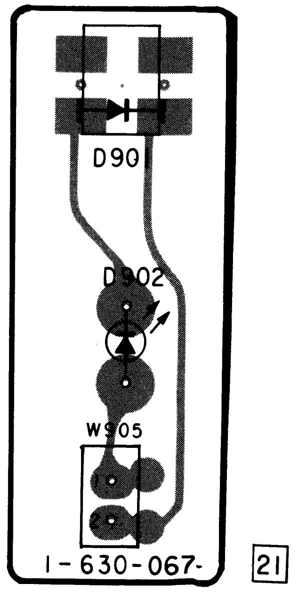
A
B
C
CN904
W902
L901
C917
C901
G3
G2
C912
W901
L903
G1
H1
H2
G2
G3
HV
PICTURE TUBE
V901
M01KGG007WB
RV901
T901
L902
C904
C909
C911
TH901
CN902
CP901
CN901
1-630-066-
21
①
②
③
④
⑤

VF-22PBOARD (CONDUCTOR SIDE)



D
E
D903
R916
R913
C918
R920
C907
Q904
R950
1-630-066-
21
2
3
4
5
6
7

LD-17PBOARD

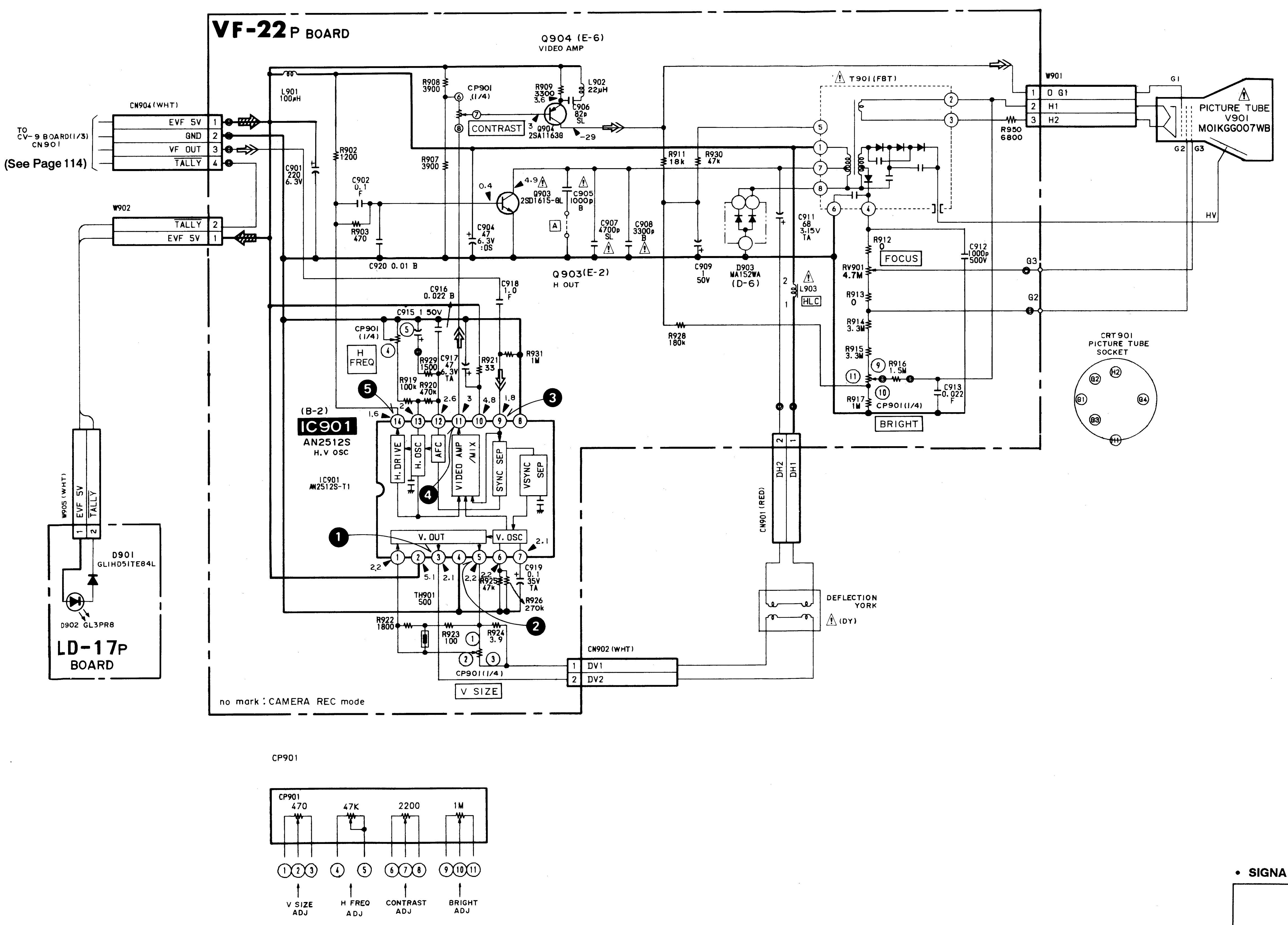


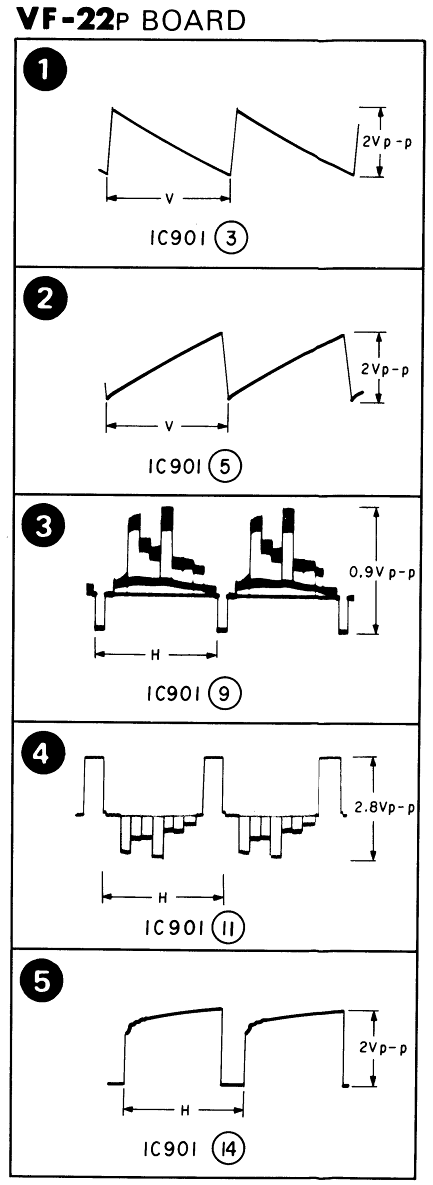
D901
D902
W905
1-630-067-
21

ELECTRICAL VIEW FINDER ELECTRICAL VIEW FINDER

VF-22P (ELECTRONIC VIEW FIDER), LD-17P (TALLY LED) SCHEMATIC DIAGRAMS

— Ref. No. VF-22P BOARD: 4000 series, LD-17P BOARD: 5000 series —


VF-22P BOARD
Q904 (E-6)
VIDEO AMP
TO CV-9 BOARD(1/3) CN901
(See Page 114)
CN904 (WHT)
EVF 5V
GND
VF OUT
TALLY
W902
TALLY
EVF 5V
L901 100μH
C901 220 6.3V
R902 1200
C902 0.1 F
R903 470
C920 0.01 B
R908 3900
R907 3900
CP901 (1/4)
CONTRAST
R909 3300
3.6
Q904 2SA1163B
C906 82p SL
L902 22μH
-29
Q903 2SD1615-BL
4.9
0.4
C904 47 6.3V :OS
C905 1000p B
C907 4700p SL
C908 3300p B
Q903 (E-2)
H OUT
R911 18k
R930 47k
C909 1 50V
D903 MA152WA (D-6)
C911 68 3.15V TA
L903
HLC
T901 (FBT)
R950 6800
W901
0 G1
H1
H2
G1
PICTURE TUBE
V901
M01KGG007WB
G2 G3
HV
R912 0
FOCUS
RV901 4.7M
C912 1000p 500V
G3
G2
R913 0
R914 3.3M
R915 3.3M
R916 1.5M
C913 0.022 F
R917 1M
CP901 (1/4)
BRIGHT
R928 180k
C916 0.022 B
C918 1.0 F
C915 1 50V
CP901 (1/4)
H FREQ
R929 1500
C917 47 6.3V TA
R921 33
R931 1M
R919 100k
R920 470k
(B-2)
IC901
AN2512S
H.V OSC
IC901 AN2512S-T1
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V.OUT
V.OSC
1.6
2.6
3
4.8
1.8
2.2
5.1
2.1
2.1
C919 0.1 35V TA
R925 47k
R926 270k
TH901 500
R922 1800
R923 100
R924 3.9
CP901 (1/4)
V SIZE
CN902 (WHT)
DV1
DV2
CN901 (RED)
DH2
DH1
DEFLECTION YORK
(DY)
CRT901 PICTURE TUBE SOCKET
W905 (WHT)
EVF 5V
TALLY
D901 GL1HD51TE84L
D902 GL3PR8
LD-17P BOARD
no mark : CAMERA REC mode
CP901
470
47K
2200
1M
V SIZE ADJ
H FREQ ADJ
CONTRAST ADJ
BRIGHT ADJ



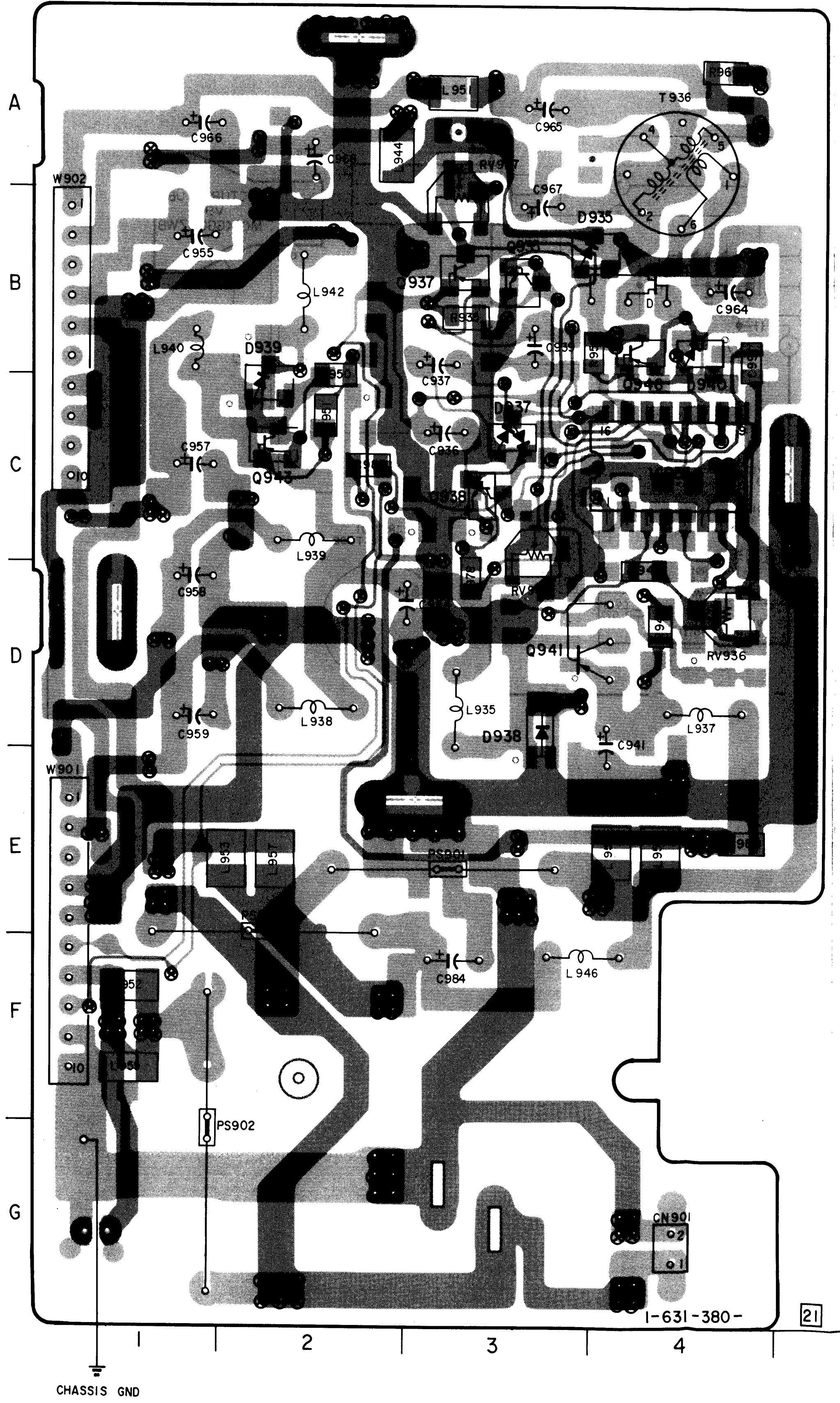
- **SIGNAL PATH (ANALOG)**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB		⇨		

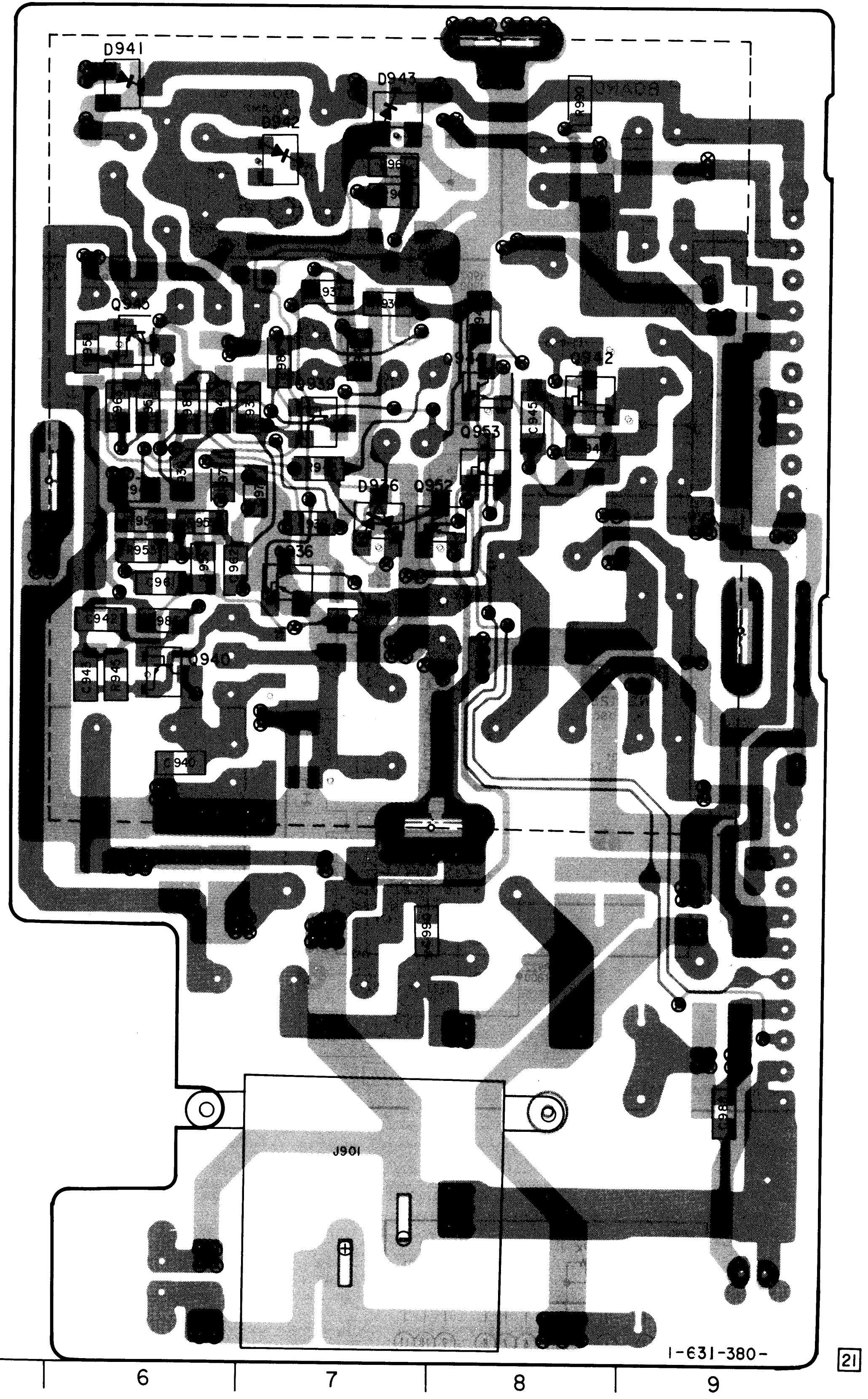
PS-225P (POWER SUPPLY) PRINTED WIRING BOARDS

— Ref. No. PS-225P BOARD: 1000 series —

PS-225PBOARD (COMPONENT SIDE)

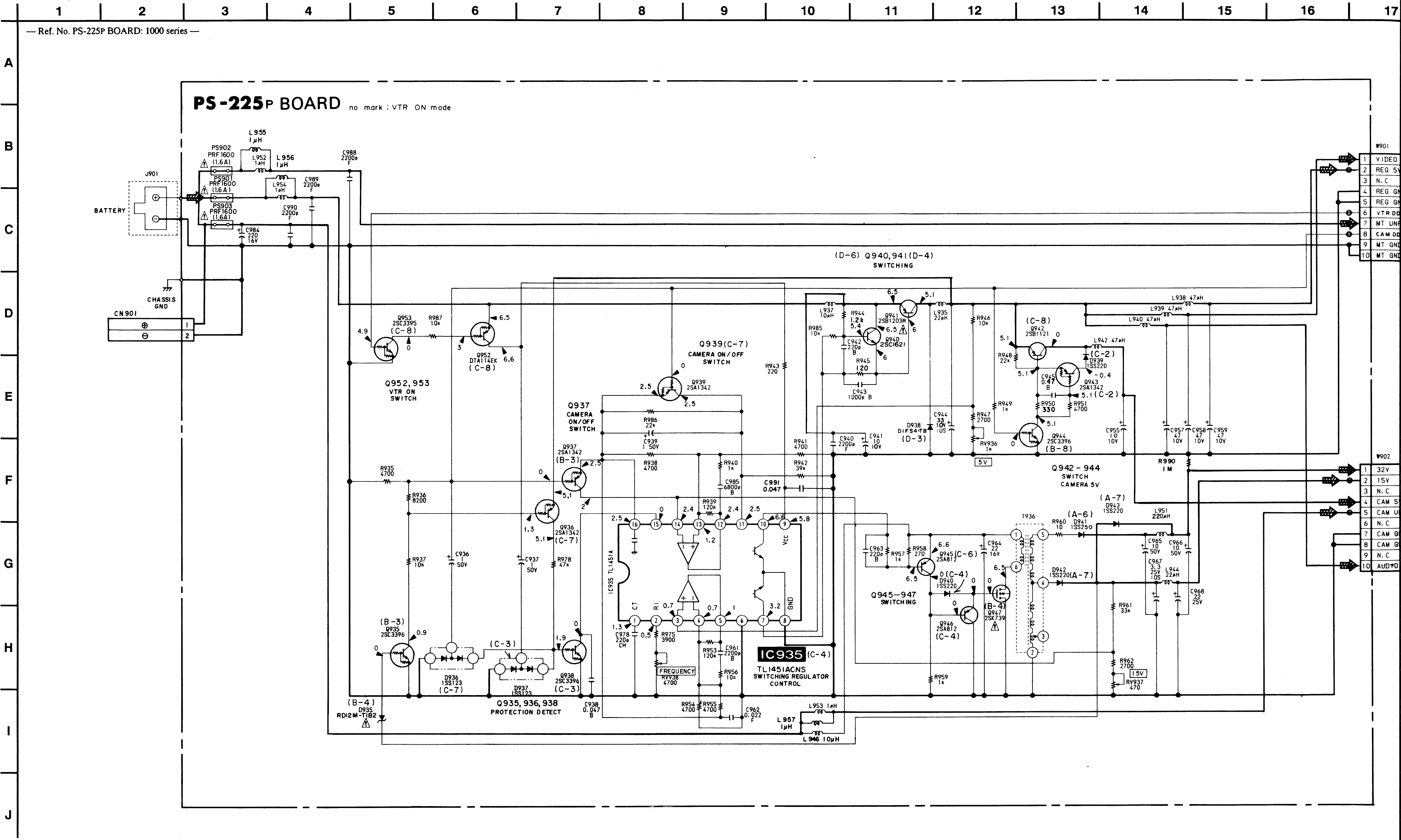

A
B
C
D
E
F
G
W902
W901
C966
C968
L951
C965
T936
C967
RV937
D935
C955
L942
Q937
C964
L940
D939
C937
C935
D937
C957
C936
Q943
L939
C958
RV936
Q941
RV9
C959
L938
L935
D938
C941
L937
PS901
C984
L946
PS902
CN901
1-631-380-
21
1
2
3
4
5
CHASSIS GND

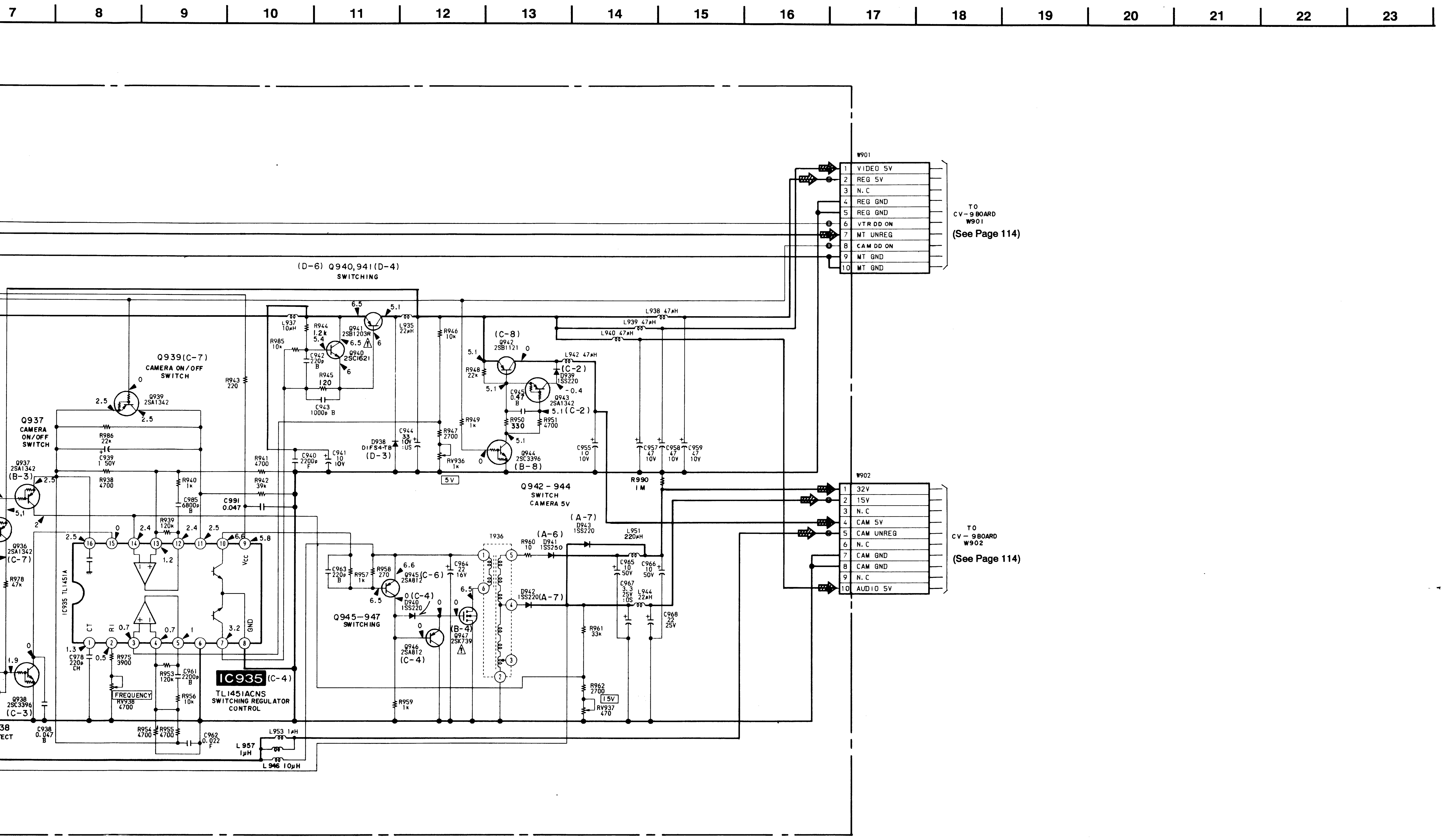
PS-225PBOARD (CONDUCTOR SIDE)


D941
D943
D942
Q936
Q942
Q953
D936
Q952
Q940
T940
J901
1-631-380-
21
6
7
8
9

PS-225P (POWER SUPPLY) SCHEMATIC DIAGRAMS

— Ref. No. PS-225P BOARD: 1000 series —


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
A B C D E F G H I J
PS-225P BOARD no mark : VTR ON mode
J901
BATTERY
CHASSIS GND
CN901
PS902 PRF1600 (1.6A)
PS901 PRF1600 (1.6A)
PS903 PRF1600 (1.6A)
L955 1μH
L952 1μH
L956 1μH
L954 1μH
C988 2200p F
C989 2200p F
C990 2200p F
C984 220 16V
Q952, 953 VTR ON SWITCH
Q953 2SC3395 (C-8)
Q952 DTA114EK (C-8)
R987 10k
Q939 (C-7) CAMERA ON/OFF SWITCH
Q939 2SA1342
Q937 CAMERA ON/OFF SWITCH
Q937 2SA1342 (B-3)
Q936 2SA1342 (C-7)
R986 22k
C939 1 50V
R938 4700
R935 4700
R936 8200
R937 10k
C936 1 50V
C937 1 50V
R978 47k
Q935 2SC3396 (B-3)
Q938 2SC3396 (C-3)
D936 1SS123 (C-7)
D937 1SS123
Q935, 936, 938 PROTECTION DETECT
D935 RD12M-T1B2 (B-4)
C938 0.047 B
IC935 TL1451A
IC935 (C-4) TL1451ACNS SWITCHING REGULATOR CONTROL
CT RT Vcc GND
C978 220p CH
R975 3900
RV938 4700 FREQUENCY
R939 120k
R940 1k
C985 6800p B
C991 0.047
R953 120k
C961 2200p B
R956 10k
R954 4700
R955 4700
C962 0.022 F
R943 220
R941 4700
R942 39k
C940 2200p F
C941 10 10V
L953 1μH
L957 1μH
L946 10μH
(D-6) Q940, 941 (D-4) SWITCHING
L937 10μH
R985 10k
R944 1.2k
Q941 2SB1203R
Q940 2SC1621
C942 220p B
R945 120
C943 1000p B
L935 22μH
D938 D1FS4-TB (D-3)
C944 33 10V :US
R946 10k
R947 2700
RV936 1k
5V
Q942 2SB1121 (C-8)
R948 22k
C945 0.47 B
D939 1SS220 (C-2)
Q943 2SA1342 (C-2)
R949 1k
R950 330
R951 4700
Q944 2SC3396 (B-8)
Q942-944 SWITCH CAMERA 5V
L942 47μH
L938 47μH
L939 47μH
L940 47μH
C955 10 10V
C957 47 10V
C958 47 10V
C959 47 10V
R990 1M
Q945-947 SWITCHING
C963 220p B
R957 1k
R958 270
Q945 2SA812 (C-6)
D940 1SS220 (C-4)
Q946 2SA812 (C-4)
Q947 2SK739 (B-4)
C964 22 16V
R959 1k
T936
R960 10
D941 1SS250 (A-6)
D942 1SS220 (A-7)
D943 1SS220 (A-7)
L951 220μH
C965 10 50V
C966 10 50V
C967 3.3 25V :OS
L944 22μH
C968 22 25V
R961 33k
R962 2700
RV937 470
15V
W901
1 VIDEO
2 REG 5V
3 N.C
4 REG GN
5 REG GN
6 VTR DD
7 MT UNR
8 CAM DD
9 MT GND
10 MT GND
W902
1 32V
2 15V
3 N.C
4 CAM 5
5 CAM U
6 N.C
7 CAM G
8 CAM G
9 N.C
10 AUDIO


7
8
9
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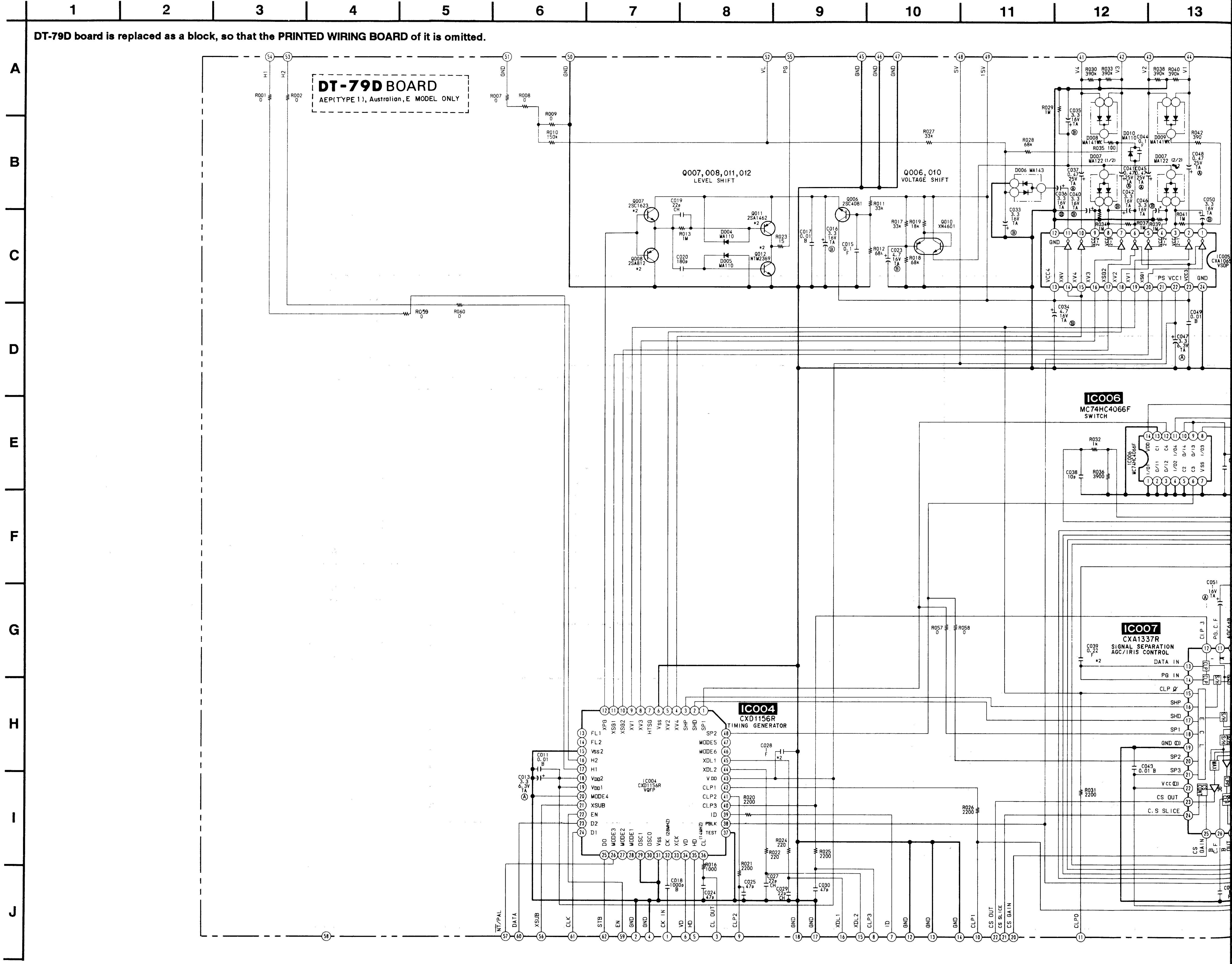
11
12
13
14
15
16
17
18
19
20
21
22
23
W901
1 VIDEO 5V
2 REG 5V
3 N.C
4 REG GND
5 REG GND
6 VTR DD ON
7 MT UNREG
8 CAM DD ON
9 MT GND
10 MT GND
TO CV-9 BOARD W901
(See Page 114)
W902
1 32V
2 15V
3 N.C
4 CAM 5V
5 CAM UNREG
6 N.C
7 CAM GND
8 CAM GND
9 N.C
10 AUDIO 5V
TO CV-9BOARD W902
(See Page 114)
(D-6) Q940,941(D-4)
SWITCHING
Q939(C-7)
CAMERA ON/OFF SWITCH
Q939 2SA1342
Q937
CAMERA ON/OFF SWITCH
Q937 2SA1342 (B-3)
Q936 2SA1342 (C-7)
Q938 2SC3396 (C-3)
Q941 2SB1203R
Q940 2SC1621
Q942 2SB1121
(C-8)
Q943 2SA1342
Q944 2SC3396 (B-8)
D939 1SS220 (C-2)
D938 D1FS4-TB (D-3)
Q942-944
SWITCH CAMERA 5V
Q945 2SA812 (C-6)
D940 1SS220 (C-4)
Q946 2SA812 (C-4)
Q947 2SK739 (B-4)
Q945-947
SWITCHING
T936
D941 1SS250 (A-6)
D942 1SS220 (A-7)
D943 1SS220 (A-7)
IC935 (C-4)
TL1451ACNS
SWITCHING REGULATOR CONTROL
IC935 TL1451A
CT
RI
Vcc
GND
FREQUENCY RV938 4700
RV936 1k
RV937 470
5V
15V
L937 10μH
L935 22μH
L938 47μH
L939 47μH
L940 47μH
L942 47μH
L951 220μH
L944 22μH
L953 1μH
L957 1μH
L946 10μH
R944 1.2k
R945 120
R946 10k
R947 2700
R948 22k
R949 1k
R950 330
R951 4700
R985 10k
R943 220
R941 4700
R942 39k
R986 22k
R938 4700
R940 1k
R939 120k
R978 47k
R975 3900
R953 120k
R956 10k
R954 4700
R955 4700
R957 1k
R958 270
R959 1k
R960 10
R961 33k
R962 2700
R990 1M
C942 220p B
C943 1000p B
C944 33 10V :US
C940 2200p F
C941 10 10V
C945 0.47 B
C955 10 10V
C957 47 10V
C958 47 10V
C959 47 10V
C939 1 50V
C985 6800p B
C991 0.047
C978 220p CH
C961 2200p B
C962 0.022 F
C938 0.047 B
C963 220p B
C964 22 16V
C965 10 50V
C966 10 50V
C967 3.3 25V :OS
C968 22 25V
6.5
5.1
5.4
6.5
6
6
5.1
0
5.1
-0.4
5.1
5.1
0
2.5
0
2.5
2.5
5.1
2
0
2.4
1.2
2.4
2.5
6.6
5.8
2.5
1.3
0.5
0.7
0.7
1
3.2
1.9
0
6.6
6.5
0
0
6.5
0
38
ECT

DT-79D (CCD DRIVE, TIMING GENERATOR) SCHEMATIC DIAGRAMS

DT-79D board is replaced as a block, so that the PRINTED WIRING BOARD of it is omitted.


1
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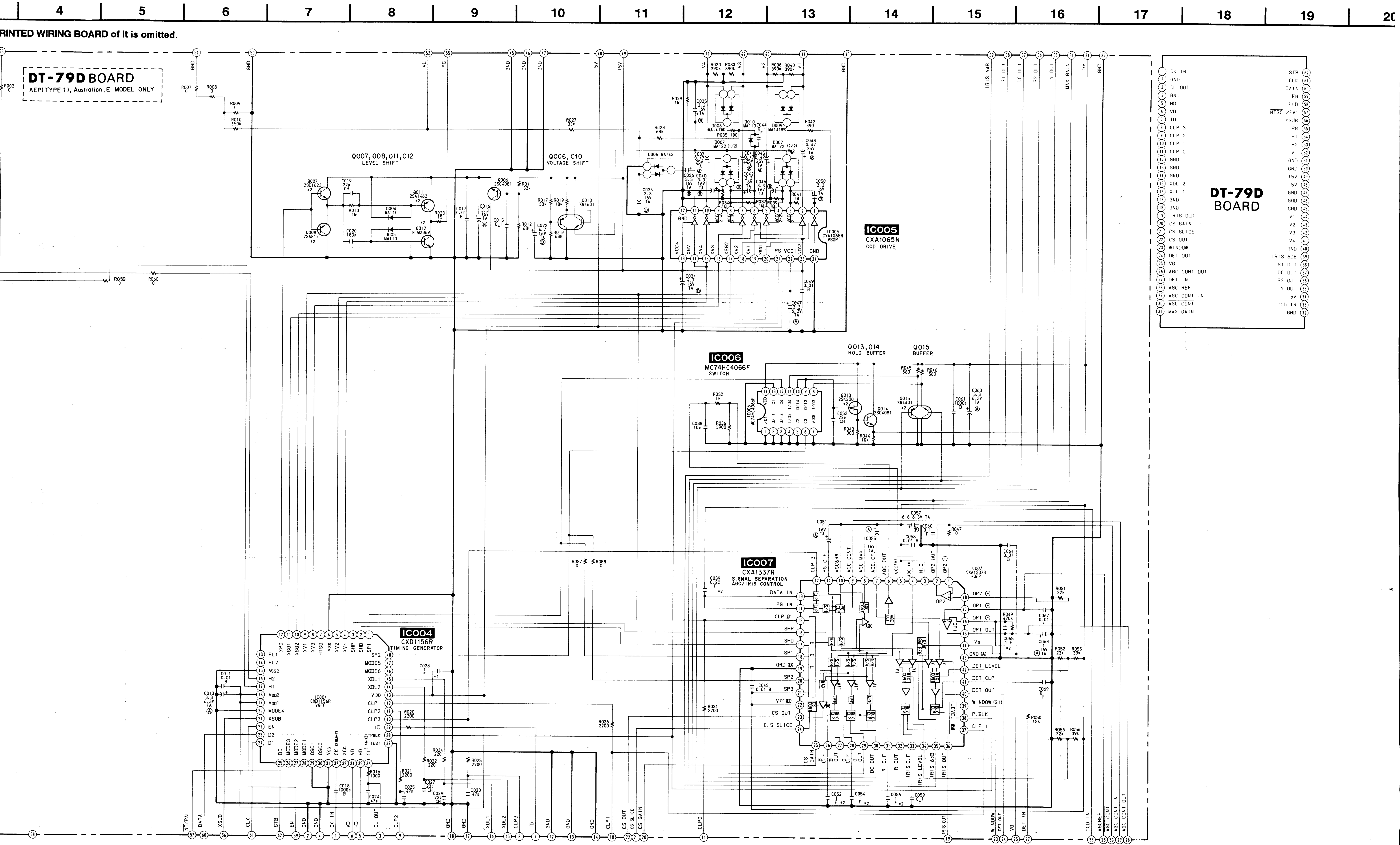
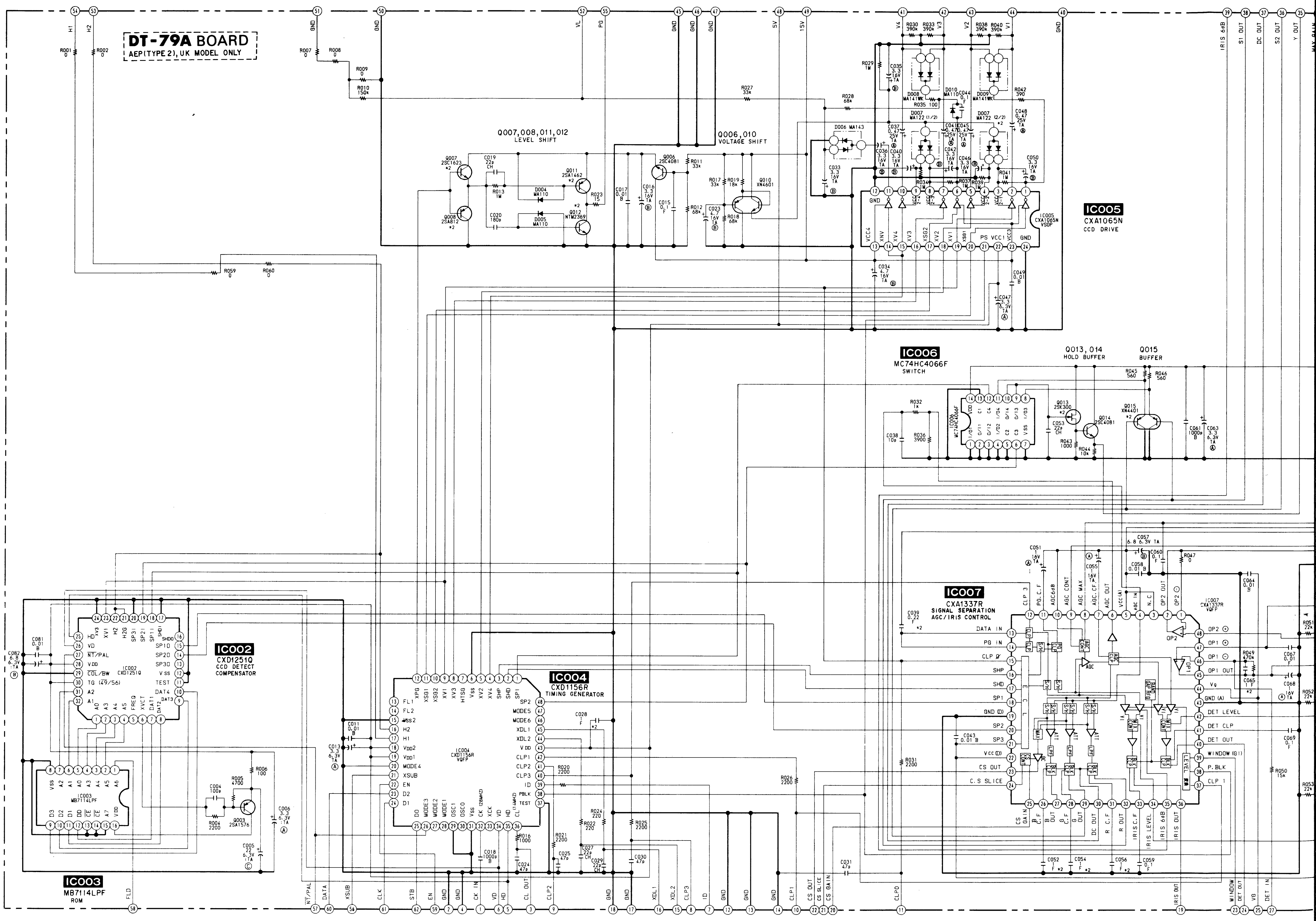
11
12
13
A
B
C
D
E
F
G
H
I
J
DT-79D BOARD
AEP(TYPE1), Australian, E MODEL ONLY
Q007,008,011,012
LEVEL SHIFT
Q006,010
VOLTAGE SHIFT
D006 MA143
IC005
IC006
MC74HC4066F
SWITCH
IC007
CXA1337R
SIGNAL SEPARATION
AGC/IRIS CONTROL
IC004
CXD1156R
TIMING GENERATOR
H1
H2
GND
VL
PG
SV
15V
V4
V3
V2
V1
NT/PAL
DATA
XSUB
CLK
STB
EN
CK IN
VD
HD
CL OUT
CLP2
XDL1
XDL2
CLP3
ID
CLP1
CS OUT
CS SLICE
CS GAIN
CLP0
DATA IN
PG IN
SHP
SHD
SP1
SP2
SP3
VCC
C.S SLICE

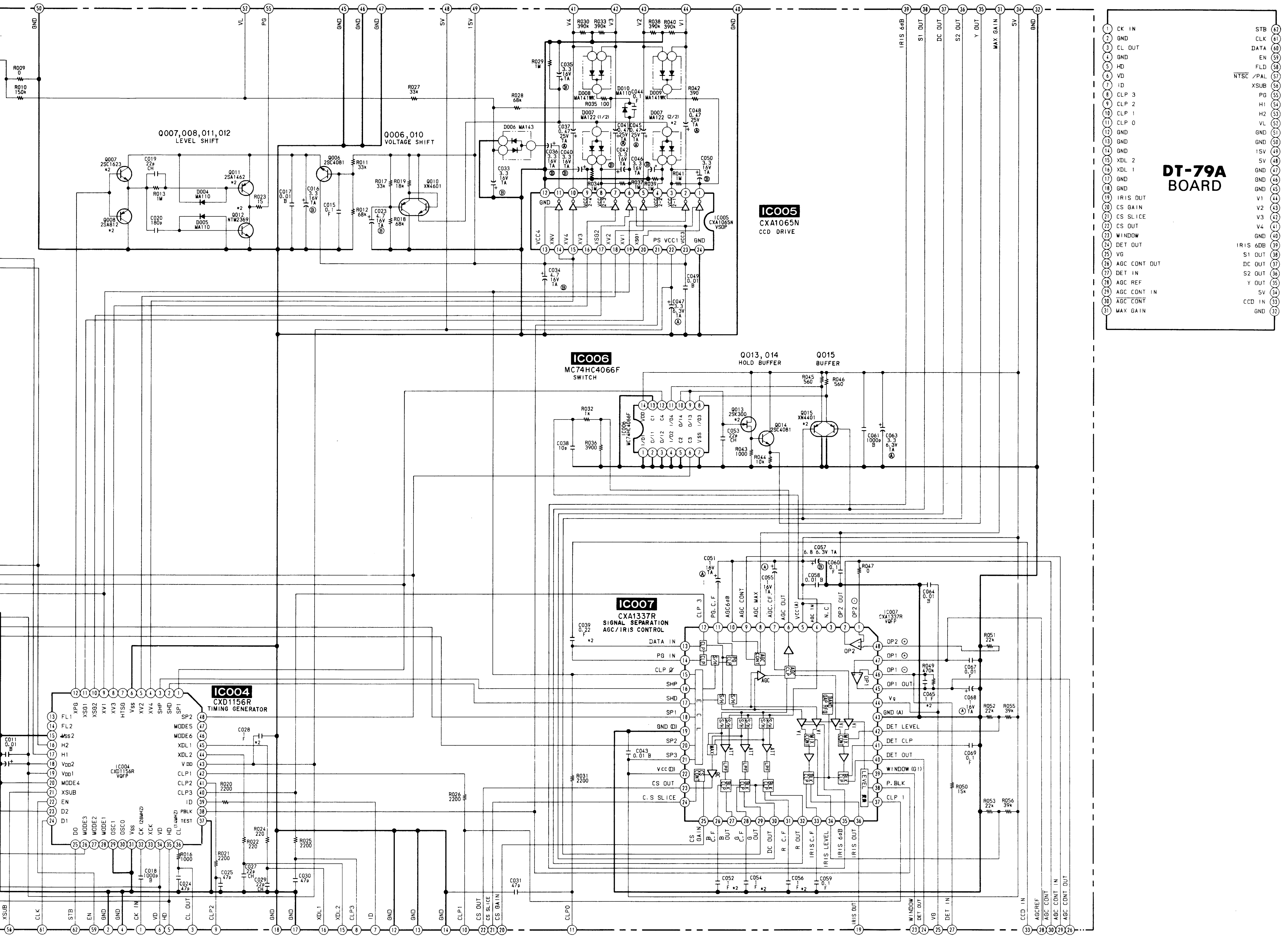
RINTED WIRING BOARD of it is omitted.


4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
2C
DT-79D BOARD
AEP(TYPE 1), Australian, E MODEL ONLY
Q007,008,011,012
LEVEL SHIFT
Q006,010
VOLTAGE SHIFT
IC005
CXA1065N
CCD DRIVE
IC006
MC74HC4066F
SWITCH
Q013,014
HOLD BUFFER
Q015
BUFFER
IC007
CXA1337R
SIGNAL SEPARATION
AGC/IRIS CONTROL
IC004
CXD1156R
TIMING GENERATOR
DT-79D
BOARD
1 CK IN
2 GND
3 CL OUT
4 GND
5 HD
6 VD
7 ID
8 CLP 3
9 CLP 2
10 CLP 1
11 CLP 0
12 GND
13 GND
14 GND
15 XDL 2
16 XDL 1
17 GND
18 GND
19 IRIS OUT
20 CS GAIN
21 CS SLICE
22 CS OUT
23 WINDOW
24 DET OUT
25 VG
26 AGC CONT OUT
27 DET IN
28 AGC REF
29 AGC CONT IN
30 AGC CONT
31 MAX GAIN
STB 62
CLK 61
DATA 60
EN 59
FLD 58
NTSC/PAL 57
XSUB 56
PG 55
H1 54
H2 53
VL 52
GND 51
GND 50
15V 49
5V 48
GND 47
GND 46
GND 45
V1 44
V2 43
V3 42
V4 41
GND 40
IRIS 6DB 39
S1 OUT 38
DC OUT 37
S2 OUT 36
Y OUT 35
5V 34
CCD IN 33
GND 32

DT-79A (CCD DRIVE, TIMING GENERATOR) SCHEMATIC DIAGRAMS

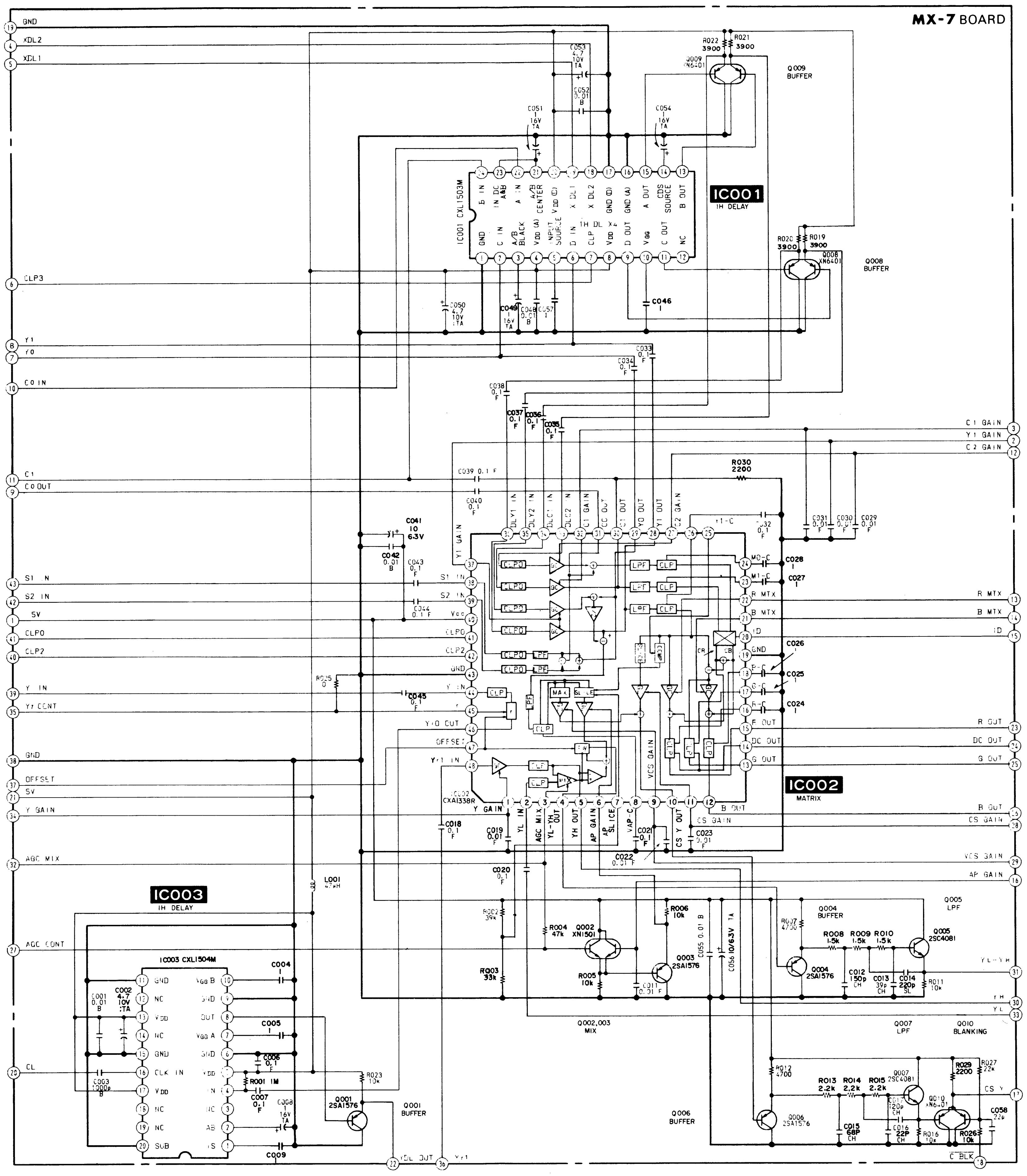
DT-79A board is replaced as a block, so that the PRINTED WIRING BOARD of it is omitted.


DT-79A BOARD
AEP(TYPE 2), UK MODEL ONLY
Q007,008,011,012 LEVEL SHIFT
Q006,010 VOLTAGE SHIFT
IC005
CXA1065N
CCD DRIVE
IC006
MC74HC4066F
SWITCH
Q013, 014 HOLD BUFFER
Q015 BUFFER
IC007
CXA1337R
SIGNAL SEPARATION
AGC/IRIS CONTROL
IC002
CXD1251Q
CCD DETECT COMPENSATOR
IC004
CXD1156R
TIMING GENERATOR
IC003
MB7114LPF
ROM

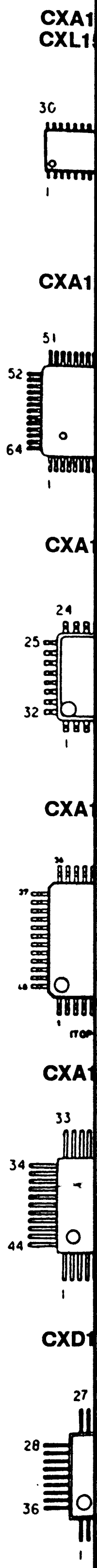

Q007,008,011,012
LEVEL SHIFT
Q006,010
VOLTAGE SHIFT
IC005
CXA1065N
CCD DRIVE
IC006
MC74HC4066F
SWITCH
Q013,014
HOLD BUFFER
Q015
BUFFER
IC007
CXA1337R
SIGNAL SEPARATION
AGC/IRIS CONTROL
IC004
CXD1156R
TIMING GENERATOR
DT-79A
BOARD
1 CK IN
2 GND
3 CL OUT
4 GND
5 HD
6 VD
7 ID
8 CLP 3
9 CLP 2
10 CLP 1
11 CLP 0
12 GND
13 GND
14 GND
15 XDL 2
16 XDL 1
17 GND
18 GND
19 IRIS OUT
20 CS GAIN
21 CS SLICE
22 CS OUT
23 WINDOW
24 DET OUT
25 VG
26 AGC CONT OUT
27 DET IN
28 AGC REF
29 AGC CONT IN
30 AGC CONT
31 MAX GAIN
STB 62
CLK 61
DATA 60
EN 59
FLD 58
NTSC /PAL 57
XSUB 56
PG 55
H1 54
H2 53
VL 52
GND 51
GND 50
15V 49
5V 48
GND 47
GND 46
GND 45
V1 44
V2 43
V3 42
V4 41
GND 40
IRIS 6DB 39
S1 OUT 38
DC OUT 37
S2 OUT 36
Y OUT 35
5V 34
CCD IN 33
GND 32

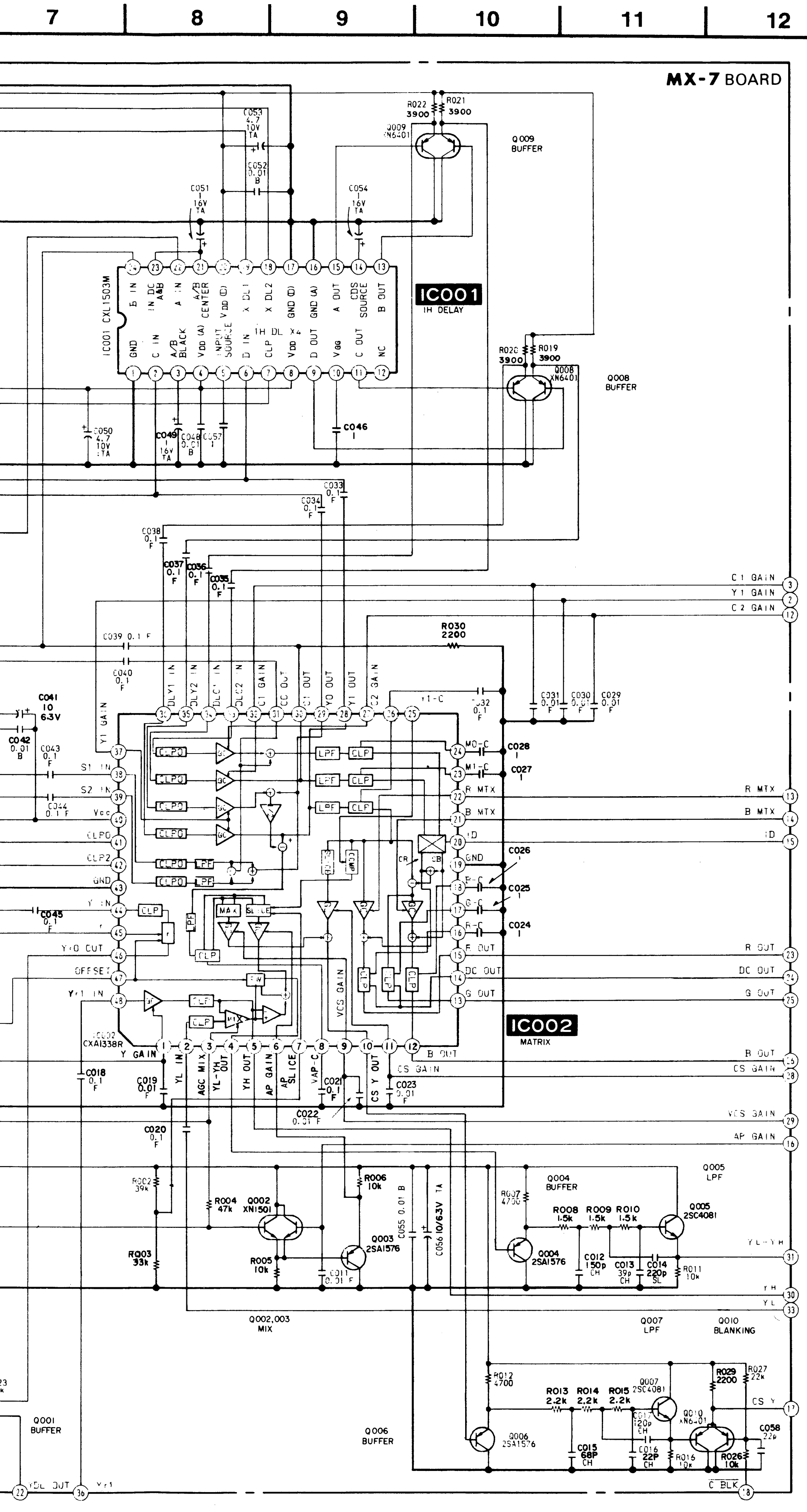
MX-7 (CAMERA SIGNAL MATRIX) SCHEMATIC DIAGRAMS

MX-7 board is replaced as a block, so that the PRINTED WIRING BOARD of it is omitted.


MX-7 BOARD
IC001 1H DELAY
IC001 CXL1503M
IC002 MATRIX
IC002 CXA1338R
IC003 1H DELAY
IC003 CXL1504M
Q001 BUFFER
Q002,003 MIX
Q004 BUFFER
Q005 LPF
Q006 BUFFER
Q007 LPF
Q008 BUFFER
Q009 BUFFER
Q010 BLANKING
GND
XDL2
XDL1
CLP3
Y1
Y0
C0 IN
C1
C0 OUT
S1 IN
S2 IN
5V
CLP0
CLP2
Y IN
YI CONT
GND
OFFSET
5V
Y GAIN
AGC MIX
AGC CONT
CL
C1 GAIN
Y1 GAIN
C2 GAIN
R MTX
B MTX
ID
R OUT
DC OUT
G OUT
B OUT
CS GAIN
VCS GAIN
AP GAIN
YL-YH
YH
YL
CS Y
C BLK
XDL OUT
Y+1
R030 2200
L001 47µH

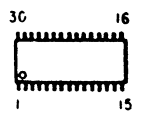
4-3. SEM


CXA1
CXL1
CXA1
CXA1
CXA1
CXA1
CXD1

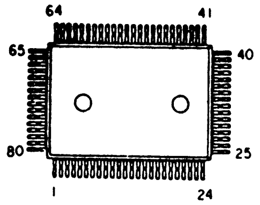

7
8
9
10
11
12
13
14
15
MX-7 BOARD
IC001
1H DELAY
IC001 CXL1503M
IC002
MATRIX
IC002 CXA1338R
Q009 BUFFER
Q008 BUFFER
Q001 BUFFER
Q002,003 MIX
Q004 BUFFER
Q005 LPF
Q006 BUFFER
Q007 LPF
Q010 BLANKING
R030 2200
C1 GAIN
Y1 GAIN
C2 GAIN
R MTX
B MTX
ID
R OUT
DC OUT
G OUT
B OUT
CS GAIN
VCS GAIN
AP GAIN
YL+YH
YH
YL
CS Y
C BLK
YL OUT

4-3. SEMICONDUCTORS

CXA1127MT
CXL1501M



CXP80116-624Q



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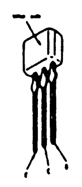

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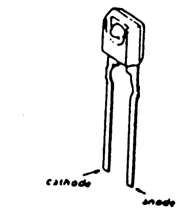

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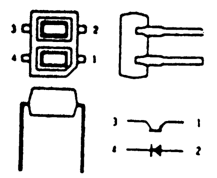

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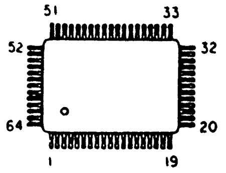
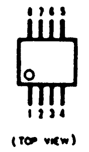


LA7293M
MM1036XF



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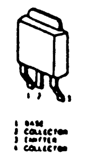

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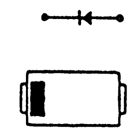

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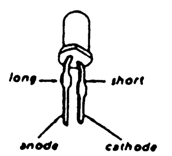

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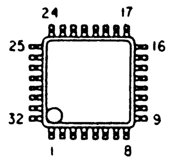

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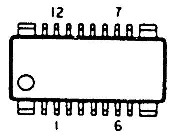

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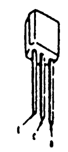
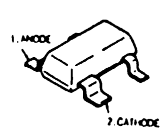


GL-1HD51



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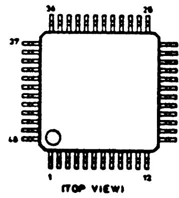
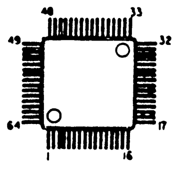


MB670479U
MC68HC05N4-SC406656



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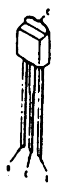
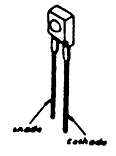
2SB1040A-5



GL452S



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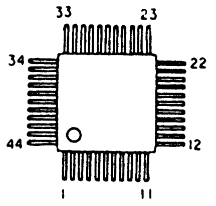

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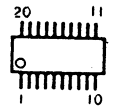
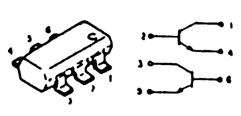
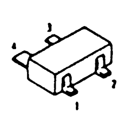


XN6501

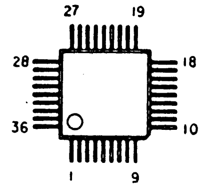


DWA010

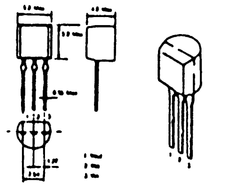


1. CATHODE
2. CATHODE
3. ANODE
4. ANODE

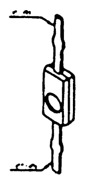
CXD1159Q



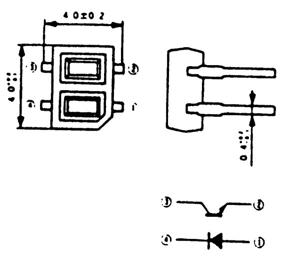
S-81350AG-REG



1T32-2
1T33C



GP2S09-B



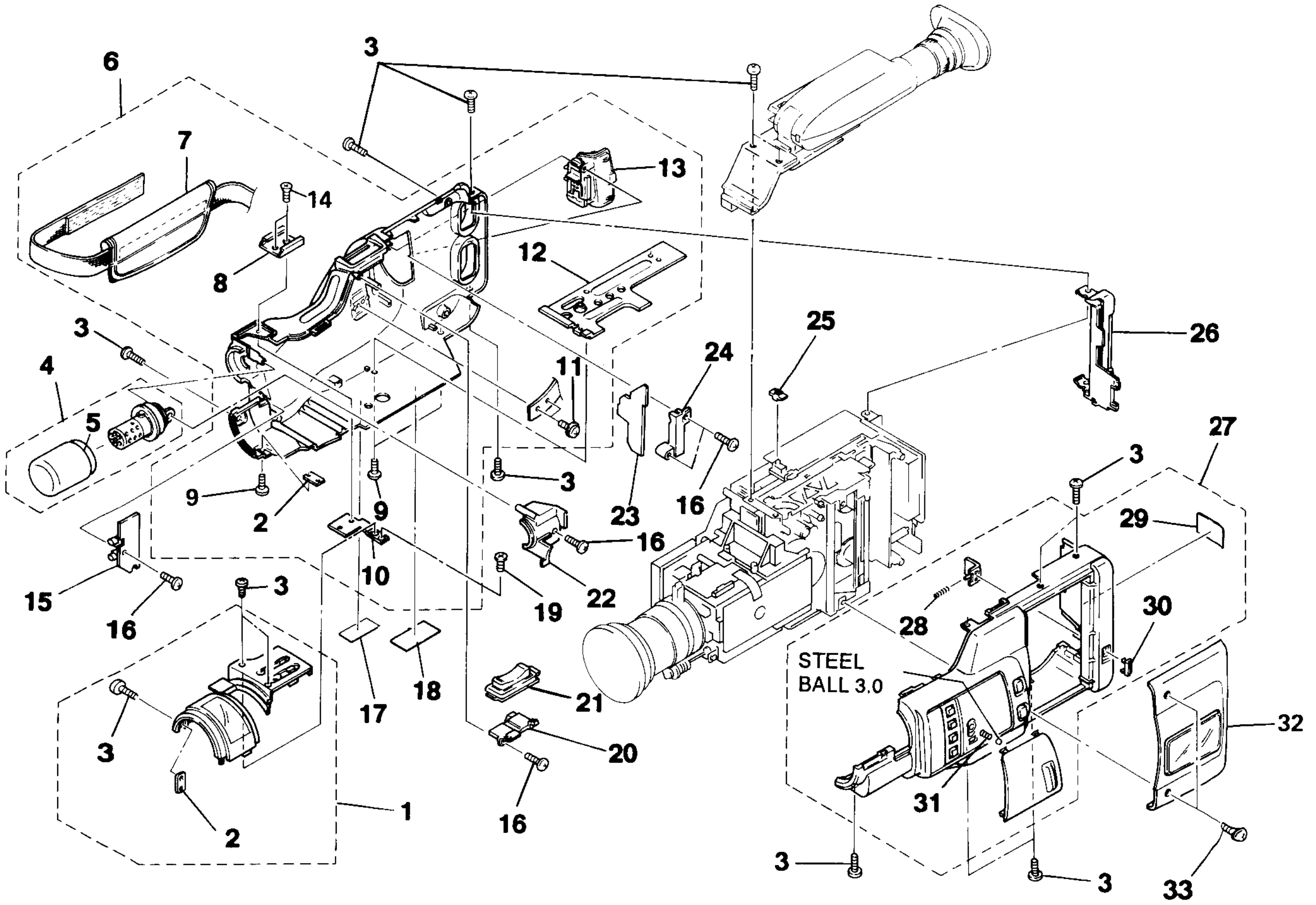
SECTION 5
EXPLODED VIEWS

NOTE:

- –XX, –X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

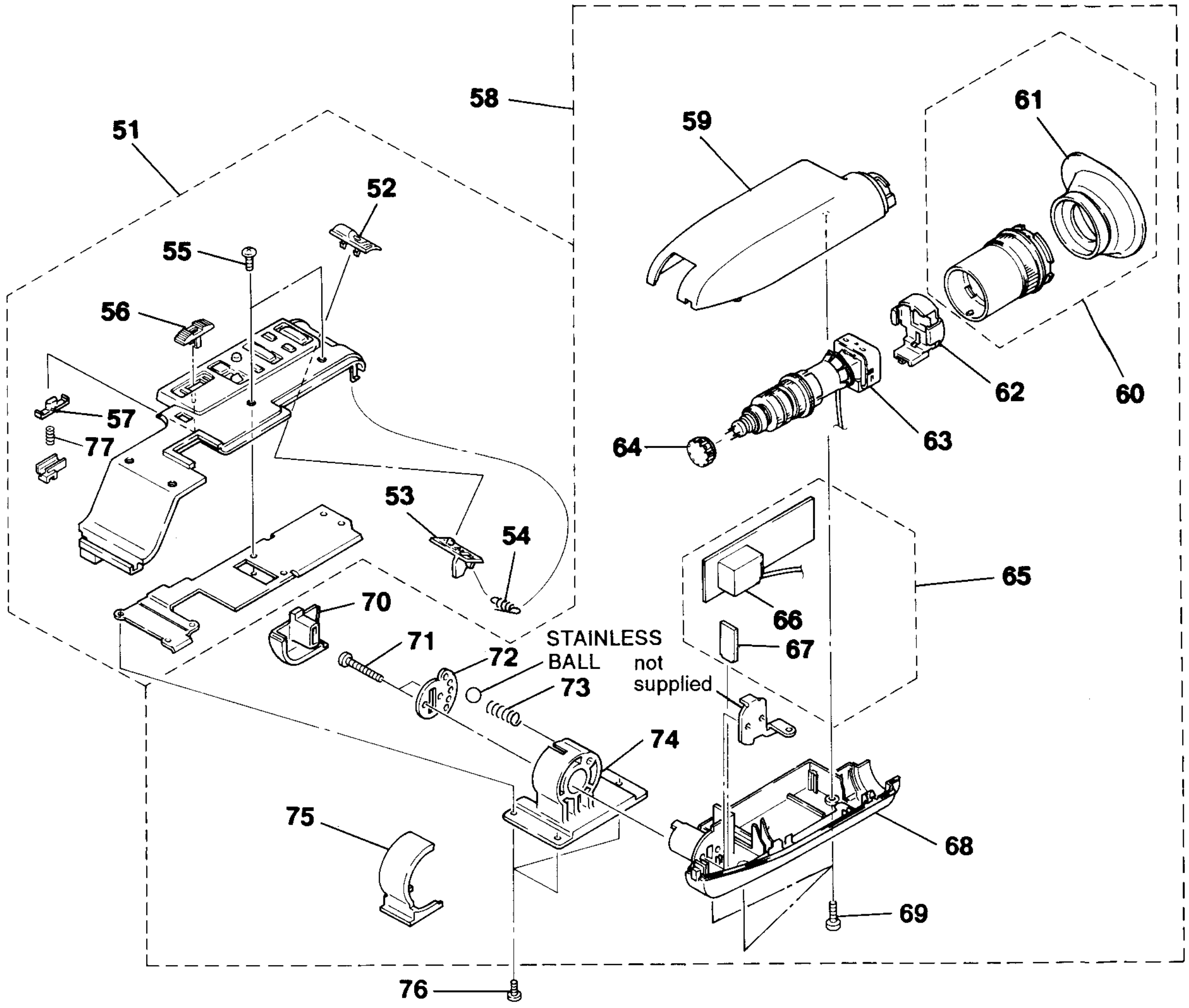
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

5-1. CABINET (R, L) ASSEMBLY



No.	Part No.	Description	Remark
1	X-3733-924-1	CABINET (FRONT) ASSY	1-3
2	3-732-912-01	JOINT, L/R	
3	3-719-381-01	SCREW (M2X4)	
4	1-542-125-21	MICROPHONE (C-2027)	5
5	3-707-650-11	SCREEN, WIND	
6	X-3733-923-1	CABINET (LEFT) ASSY (E, Australian)	2, 7-14
	X-3733-990-1	CABINET (LEFT) ASSY (AEP, UK)	2, 7-14
7	3-719-323-01	BELT, GRIP	
8	3-724-511-01	SHOE, ACCESSORY	
9	3-719-381-31	SCREW (M2X3)	
10	3-737-723-02	RETAINER, SHOE	
11	3-669-480-21	+ PTPWH 2	
12	*3-732-911-01	SHEET METAL, TRIPOD	
13	X-3732-953-1	KNOB ASSY, SP	
14	3-719-831-21	SCREW (M2X4)	
15	*A-7061-958-A	MA-37P BOARD, COMPLETE	
16	3-713-790-31	SCREW (M2X8), TAPPING, P3	
17	*3-704-235-01	LABEL, CAUTION (UK MODEL)	
18	*3-741-510-01	LABEL, MODEL NUMBER (AE) (AEP(TYPE 1))	
	*3-741-542-01	LABEL, MODEL NUMBER (AE) (AEP(TYPE 2))	
	*3-741-543-01	LABEL, MODEL NUMBER (UK) (UK)	
	*3-741-552-01	LABEL, MODEL NUMBER (E) (E, Australian)	
19	3-713-790-01	SCREW (M2X6), TAPPING, P3	
20	*3-732-937-01	RETAINER, ZOOM BUTTON	
21	1-571-837-11	SWITCH, PUSH (ZOOM SW) (S901)	
22	3-737-737-01	HOUSING, MICROPHONE	
23	*1-631-831-21	RC-29P BOARD	
24	*3-732-928-01	STOPPER, RC	
25	3-732-926-01	BUTTON, EDIT	
26	3-732-924-01	BLIND, L/R	
27	X-3733-989-1	CABINET (RIGHT) ASSY	28-31
28	3-426-508-00	SPRING, COMPRESSION	
29	*3-719-683-01	LABEL, BATTERY FITTING	
30	3-732-905-01	BUTTON, BATTERY RELEASE	
31	3-576-098-00	SPRING, COMPRESSION	
32	X-3733-992-1	LID ASSY, CASSETTE	
33	3-733-912-01	SCREW (M2X2.5), SPECIAL HEAD	

5-2. CABINET (UPPER), EVF ASSEMBLY (TYPE A)

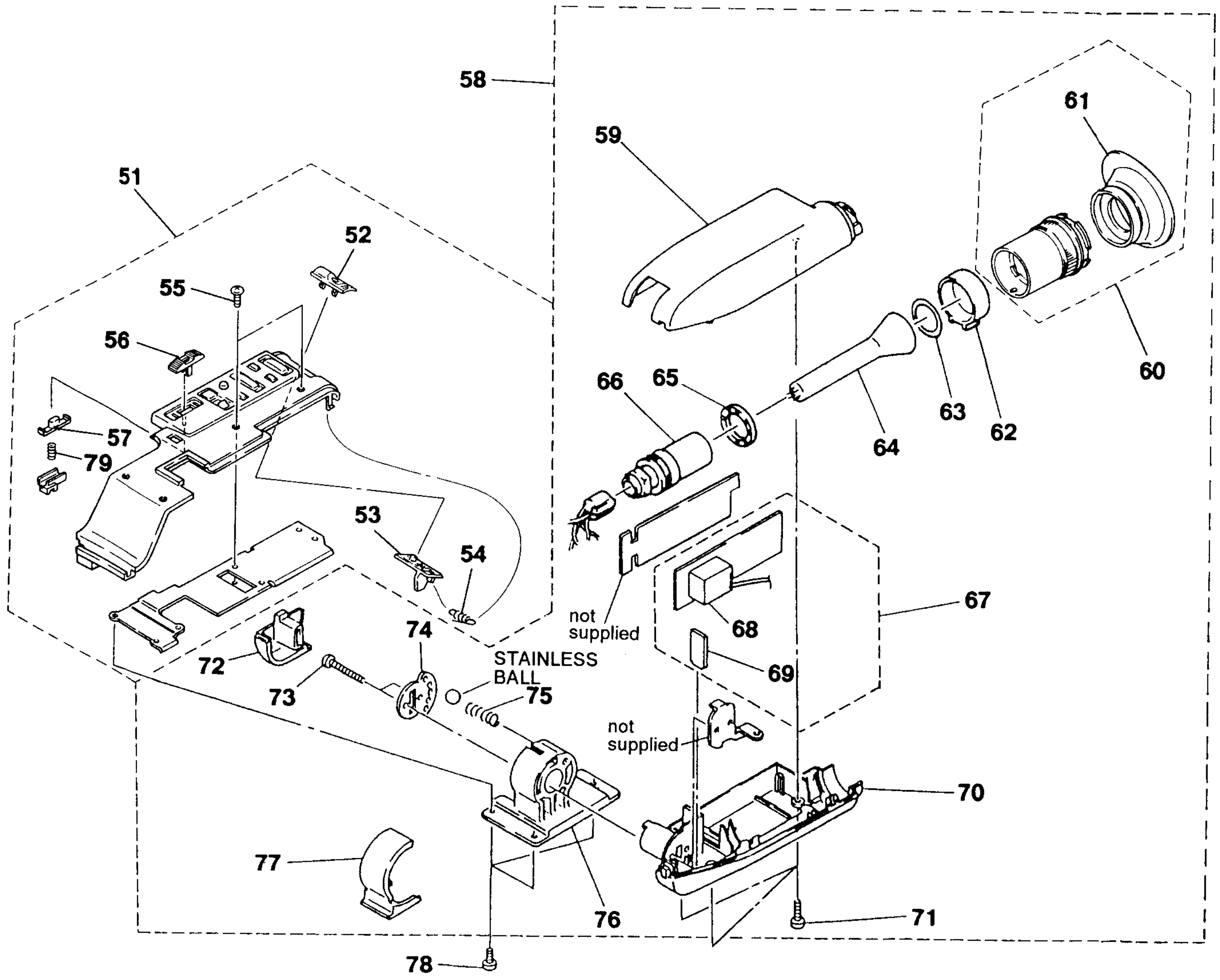


The components identified by mark ⚠ or dottedline with mark ⚠ are critical for safety.
Replace only with part number specified.

****(A TYPE)****

No.	Part No.	Description	Remark
51	X-3733-991-1	CABINET (UPPER) ASSY (AEP, UK)	52-57, 77
	X-3737-724-1	CABINET (UPPER) ASSY (E, Australian)	52-57, 77
52	3-732-919-01	BUTTON, EJECT	
53	3-732-920-01	LOCK, EJECT	
54	3-669-440-00	SPRING, TENSION	
55	3-719-381-01	SCREW (M2X4)	
56	3-718-226-01	BUTTON, POWER	
57	*3-718-257-11	BUTTON, PUSH, POWER	
58	*A-7019-146-A	EVF COMPLETE ASSY (TYPE A)	59-75
59	3-732-948-01	CABINET (UPPER), EVF	
60	A-7080-715-A	HOLDER BLOCK ASSY, FINDER	61
61	3-733-922-01	EYE CUP	
62	X-3732-910-1	HOLDER ASSY, CRT (TYPE A)	
63	⚠.1-452-482-11	CRT ASSY (M01JYZ60WB) (VF-14P BOARD) (TYPE A)	
64	1-540-019-21	SOCKET ASSY, CRT (W901) (TYPE A)	
65	*A-7061-609-A	VF-14P BOARD, COMPLETE (TYPE A)	66, 67
66	⚠.1-439-431-11	TRANSFORMER ASSY, FLYBACK (T901)(TYPE A)	
67	*1-629-384-21	LD-13P BOARD(TYPE A)	
68	X-3732-911-1	CABINET (LOWER) ASSY, EVF(TYPE A)	
69	3-713-790-31	SCREW (M2X8), TAPPING, P3	
70	3-732-949-01	BLIND, EVF CABINET (LOWER)	
71	3-732-987-01	SCREW (M2X20), +P	
72	3-732-947-01	PLATE, LOCK	
73	3-732-946-01	SPRING, COMPRESSION	
74	*3-732-944-01	BEARING, EVF	
75	3-732-950-01	BLIND, EVF	
76	3-732-988-01	SCREW (M2X2.5)	
77	3-303-973-00	SPRING, COMPRESSION	

5-3. CABINET (UPPER), EVF ASSEMBLY (TYPE B)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

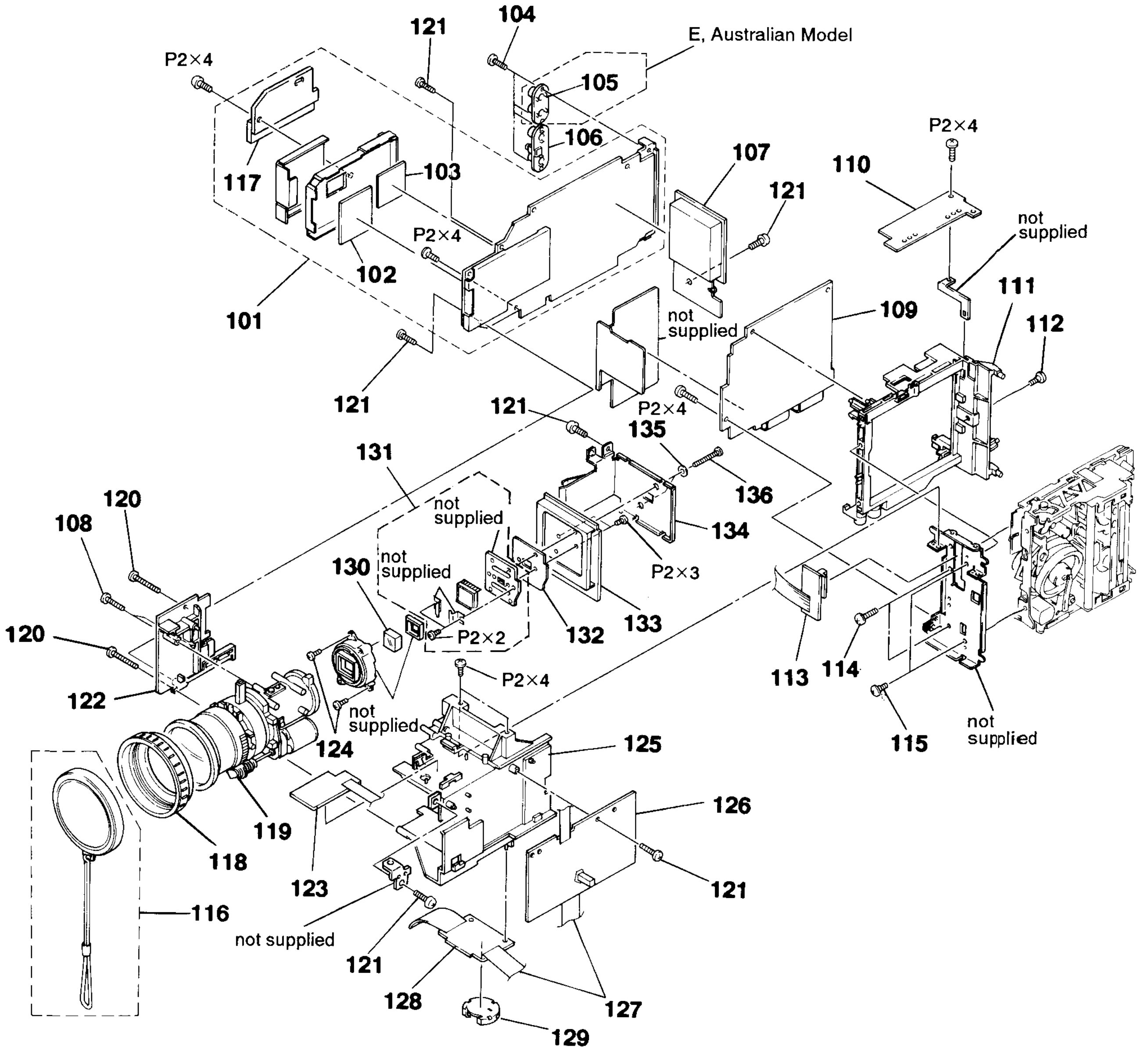
****(B TYPE)****

No.	Part No.	Description	Remark
51	X-3733-991-1	CABINET (UPPER) ASSY (AEP, UK)	52-57, 79
	X-3737-724-1	CABINET (UPPER) ASSY (E, Australian)	52-57, 79
52	3-732-919-01	BUTTON, EJECT	
53	3-732-920-01	LOCK, EJECT	
54	3-669-440-00	SPRING, TENSION	
55	3-719-381-01	SCREW (M2X4)	
56	3-718-226-01	BUTTON, POWER	
57	*3-718-257-11	BUTTON, PUSH, POWER	
58	A-7019-197-A	EVF COMPLETE ASSY (TYPE B)	59-77
59	3-732-948-01	CABINET (UPPER), EVF	
60	A-7080-715-A	HOLDER BLOCK ASSY, FINDER	61
61	3-733-922-01	EYE CUP	
62	X-3724-509-1	HOLDER ASSY, CRT (TYPE B)	
63	3-724-570-01	RING, CRT FIXED (TYPE B)	

No.	Part No.	Description	Remark
64	⚠.1-546-085-11	CATHODE-RAY TUBE, B/W (M01KGG007WB) (VF-22P BOARD)(TYPE B)	
65	3-724-549-01	LOCK, CRT (TYPE B)	
66	⚠.1-451-310-21	DEFLECTION YOKE (B/W) (TYPE B)	
67	*A-7062-012-A	VF-22P BOARD, COMPLETE (TYPE B)	68, 69
68	⚠.1-439-428-11	TRANSFORMER ASSY, FLYBACK (T901)(TYPE B)	
69	*1-630-067-21	LD-17P BOARD (TYPE B)	
70	X-3732-911-1	CABINET (LOWER) ASSY, EVF	
71	3-713-790-31	SCREW (M2X8), TAPPING, P3	
72	3-732-949-01	BLIND, EVF CABINET (LOWER)	
73	3-732-987-01	SCREW (M2X20), +P	
74	3-732-947-01	PLATE, LOCK	
75	3-732-946-01	SPRING, COMPRESSION	
76	*3-732-944-01	BEARING, EVF	
77	3-732-950-01	BLIND, EVF	
78	3-732-988-01	SCREW (M2X2.5)	
79	3-303-973-00	SPRING, COMPRESSION	

5-4. CAMERA AND MAIN BOARD ASSEMBLY

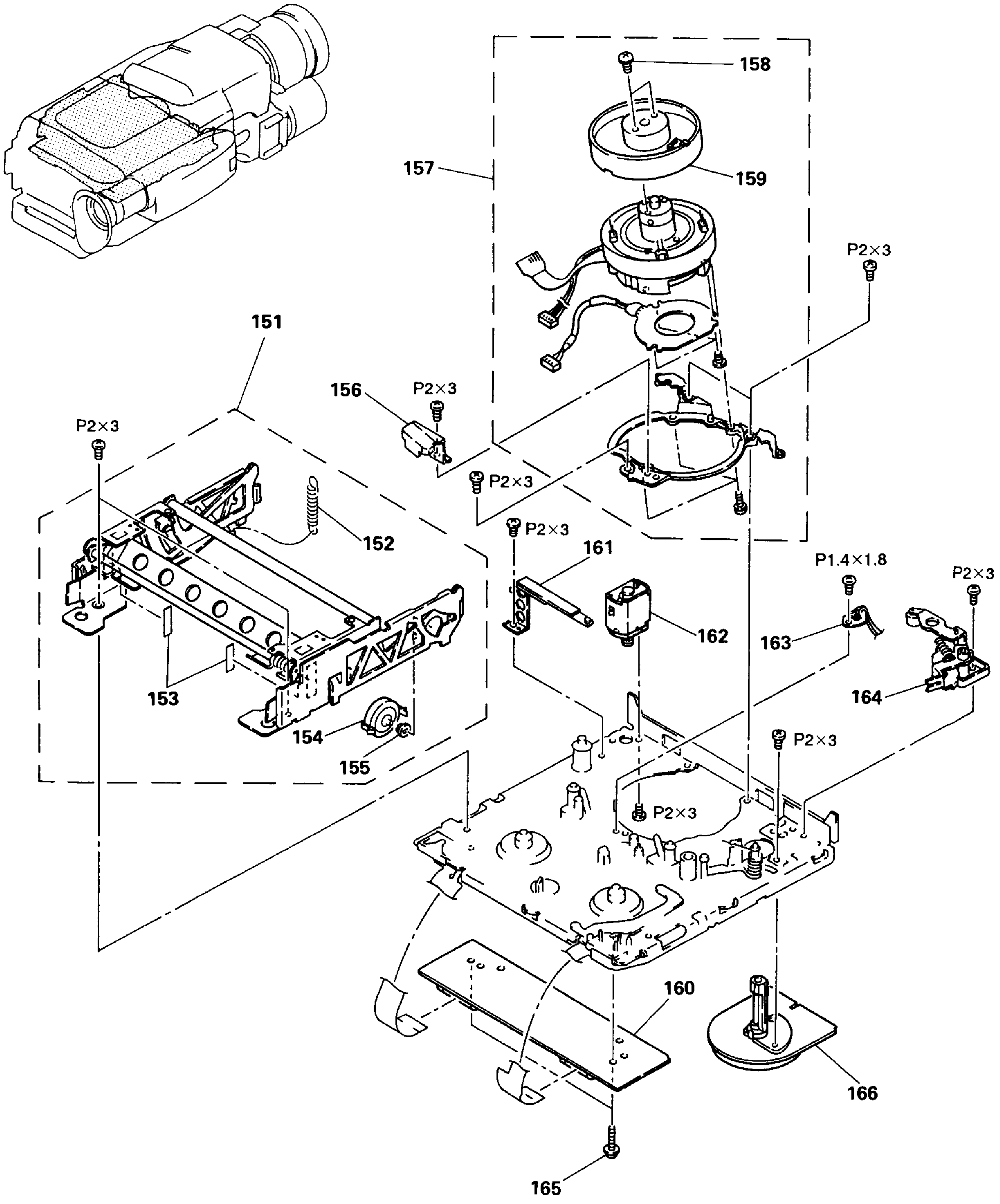
Be sure to read "Cautions for Replacement of CCD Imager" on page 83 when changing the CCD imager.



121
104
E, Australian Model
P2×4
105
106
107
110
P2×4
121
117
103
P2×4
102
not supplied
101
111
112
not supplied
109
121
121
P2×4
135
131
136
120
108
not supplied
134
not supplied
130
P2×3
133
120
P2×2
132
113
114
122
P2×4
not supplied
124
125
115
not supplied
126
119
118
123
121
116
not supplied
121
128
127
129

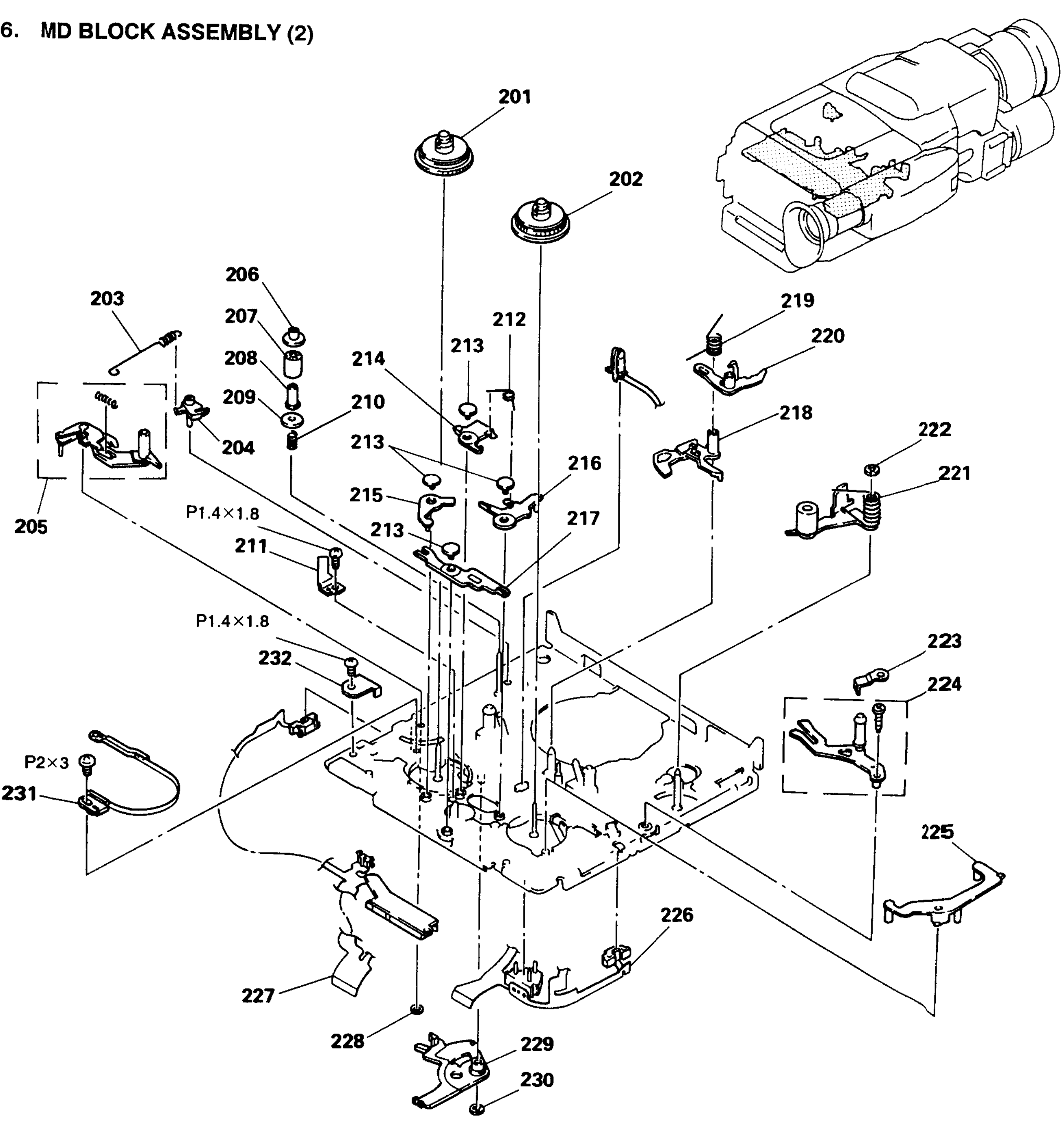
No.	Part No.	Description	Remark
101	*A-7061-957-A	CV-9 BOARD, COMPLETE (AEP, UK)	102, 103, 117
	*A-7062-054-A	CV-9 BOARD, COMPLETE (E, Australian)	102, 103, 117
102	A-7068-161-A	DT-79D (HIC) BOARD, COMPLETE (AEP(TYPE 1), E, Australian)	
	A-7068-162-A	DT-79A (HIC) BOARD, COMPLETE (AEP(TYPE 2), UK)	
103	A-7068-128-A	MX-7 (HIC) BOARD, COMPLETE	
104	3-719-695-01	SCREW (M1.7X3.5), SPECIAL HEAD	
105	1-568-409-11	JACK, PIN 2P (AUDIO/VIDEO IN) (E, Australian)	
106	1-537-142-11	TERMINAL BOARD	
107	*A-7061-955-A	PS-225P BOARD, COMPLETE	
108	3-719-408-01	SCREW (B2), TAPPING, P3	
109	*A-7061-599-A	CO-2P BOARD, COMPLETE (AEP, UK)	
	*A-7061-689-A	CO-2P BOARD, COMPLETE (E, Australian)	
110	*1-631-828-21	VK-3P BOARD	
111	*3-732-932-01	HOLDER, MD	
112	3-732-791-01	SCREW (M2X3)	
113	*1-631-827-21	KS-6P BOARD	
114	3-713-790-01	SCREW (M2X5), TAPPING, P3	
115	3-732-816-01	SCREW, STEP	
116	A-7090-806-A	CAP ASSY, HOOD	
117	*A-7051-959-A	PJ-20 BOARD, COMPLETE	
118	3-728-269-01	HOOD	
119	1-547-380-11	LENS, ZOOM (VCL-8508XB)	
120	3-713-790-31	SCREW (M2X8), TAPPING, P3	
121	3-713-790-01	SCREW (M2X6), TAPPING, P3	
122	3-737-744-01	HOLDER (B), LENS	
123	*1-631-825-21	DK-4P BOARD	
124	3-738-519-01	SCREW (M2X3), +B	
125	X-3733-928-1	HOLDER ASSY, LENS	121
126	*A-7061-954-A	CK-19P BOARD, COMPLETE	123
127	1-575-064-11	CABLE, FLAT (1.0MM PITCH)18P	
128	*A-7061-606-A	LI-10 BOARD, COMPLETE	
129	1-550-104-32	HOLDER, BATTERY	
130	A-7090-879-A	FILTER BLOCK, OPTICAL (OFB-02-02)	
131	A-7091-132-A	IC ICX027BK-2 ASSY (CCD IMAGER)	
132	*3-725-180-01	SHEET, INSULATING, CCD HOLDER	
133	*A-7061-951-A	CD-17P BOARD, COMPLETE	
134	*X-3733-929-1	SHIELD (CD) ASSY, CAMERA	
135	3-303-961-11	WASHER, POLY	
136	3-335-640-51	SCREW (M2X16)	

5-5. MD BLOCK ASSEMBLY (1)


158
157
159
P2×3
151
156
P2×3
P2×3
P2×3
152
P2×3
161
P1.4×1.8
P2×3
162
163
153
164
154
P2×3
155
P2×3
160
166
165

No.	Part No.	Description	Remark
151	X-3726-892-1	CASSETTE COMPARTMENT ASSY (N)	152-155
152	3-728-825-03	SPRING, TENSION	
153	*3-728-829-01	TAPE	
154	3-728-867-02	DAMPER, OIL	
155	3-728-828-02	GEAR, DAMPER	
156	3-728-868-01	GUARD, GUIDE	
157	A-7048-235-A	DRUM ASSY (DGU-42A-R)	158, 159
158	3-686-493-01	SCREW (M2X5), P1	
159	A-7049-215-A	DRUM ASSY UPPER, ROTARY (DGR-42R)	
160	*A-7061-953-A	CC-26P BOARD, COMPLETE	
161	1-535-739-12	TERMINAL, SHAFT EARTH	
162	A-7040-160-A	MOTOR ASSY, THREADING (M903)	
163	1-808-505-12	SENSOR (DEW)	
164	A-7040-161-B	ROLLER BLOCK ASSY, HC	
165	3-713-790-01	SCREW (M2X5), TAPPING, P3	
166	8-835-331-01	MOTOR, DC U-22A (CAPSTAN) (M902)	

5-6. MD BLOCK ASSEMBLY (2)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P1.4×1.8
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P2×3
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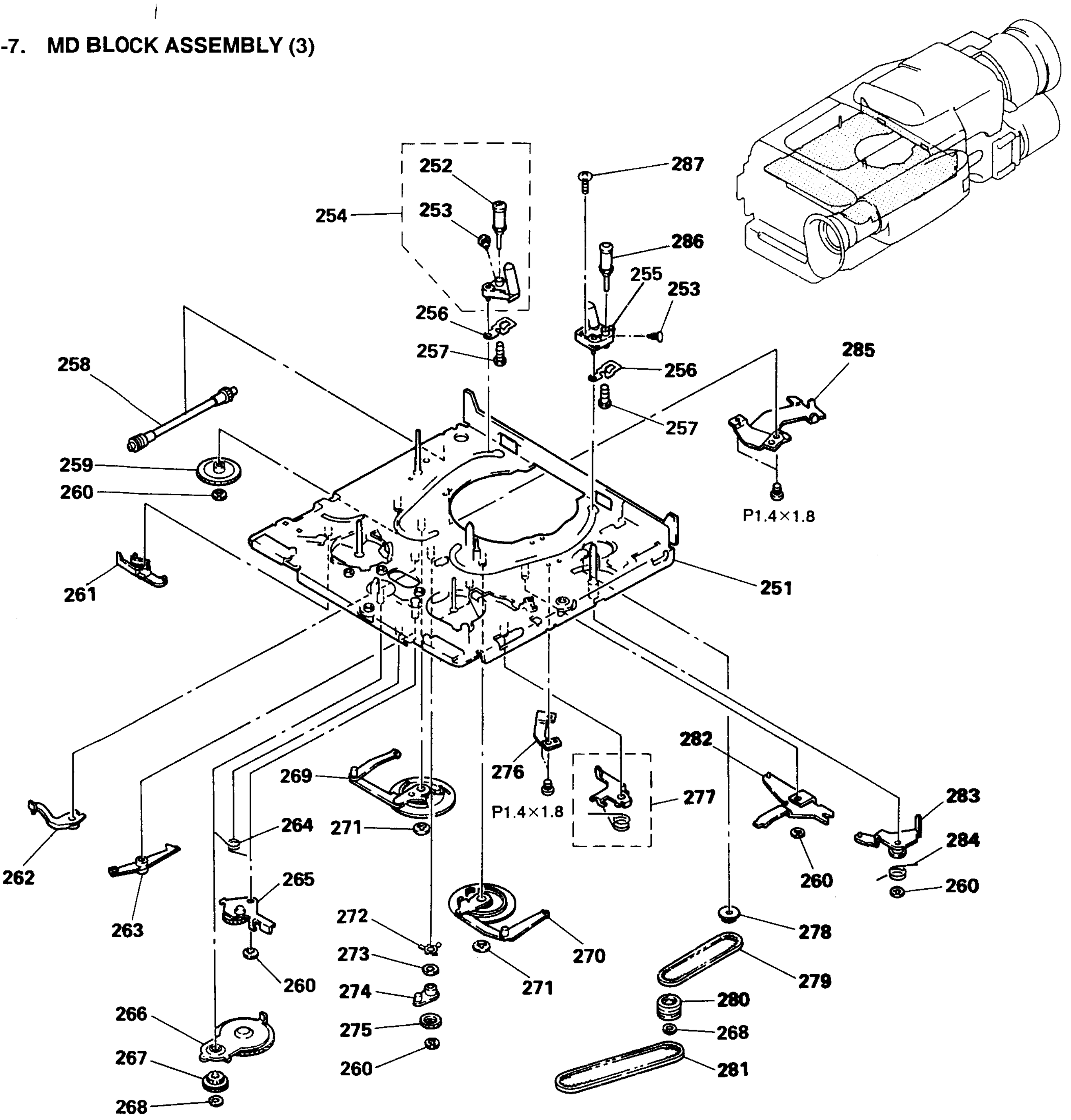
No.	Part No.	Description	Remark
201	X-3728-851-1	TABLE ASSY, REEL, S	
202	X-3728-854-1	TABLE ASSY, REEL, T	
203	3-736-414-01	SPRING, TENSION	
204	3-728-855-03	ARM, ADJUSTMENT	
205	X-3726-886-1	ARM ASSY (N), TENSION REGULATOR	
206	3-726-884-01	FLANGE, UPPER, TG2	
207	3-726-883-01	ROLLER, TG2	
208	3-726-885-01	SLEEVE, TG2	
209	3-726-882-02	FLANGE, LOWER, TG2	
210	3-726-886-01	SPRING, COMPRESSION	
211	3-726-848-01	RETAINER, TL	
212	3-726-866-01	SPRING (ST), TORSION	
213	3-726-858-01	PIN, SHAFT RETAINER	
214	3-728-849-01	BRAKE, S	
215	3-726-852-01	BRAKE, LB	
216	3-728-850-01	BRAKE, T	
217	3-726-853-01	LEVER, LB	
218	3-728-875-01	STOPPER, RK	
219	3-726-864-01	SPRING (RK), TORSION	
220	3-728-852-02	ARM, RK STOPPER	
221	A-7040-163-B	ARM BLOCK ASSY, PINCH	
222	3-669-465-00	WASHER (1.5), STOPPER	
223	3-728-808-01	SPRING, LEAF	
224	X-3726-822-1	ARM ASSY, TG7	
225	3-728-848-01	ARM, LB RELEASE	
226	1-628-061-12	FP-90 FLEXIBLE BOARD	
227	1-628-060-12	FP-89 FLEXIBLE BOARD	
228	3-321-393-11	WASHER, STOPPER	
229	X-3726-806-2	LEVER ASSY, SW	
230	3-726-829-01	WASHER, STOPPER	
231	X-3726-809-2	BAND ASSY, TENSION REGULATOR	
232	3-730-125-01	RETAINER, SW	

5-7. MD BLOCK ASSEMBLY (3)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P1.4×1.8
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P1.4×1.8
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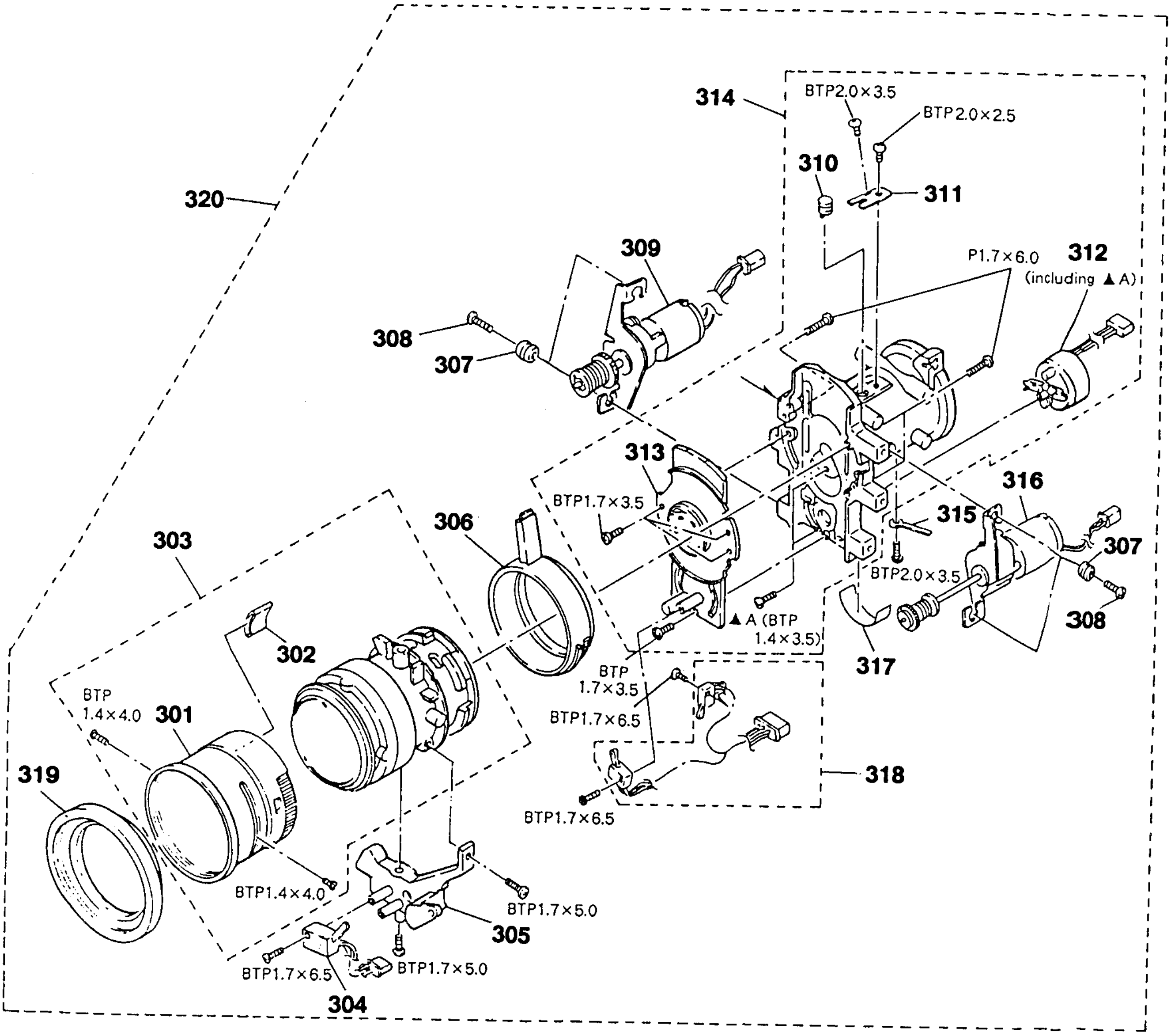
No.	Part No.	Description	Remark
251	*X-3728-801-1	CHASSIS ASSY, MECHANICAL	
252	X-3726-820-1	ROLLER ASSY (U), GUIDE	
253	3-726-822-01	SCREW (M1.4X2) (STEP), HEAD	
254	A-7040-128-A	COASTER (LEFT) BLOCK ASSY	252, 253
255	X-3728-853-1	COASTER (RIGHT) ASSY	
256	3-736-485-01	SPRING, LEAF, COSTER	
257	3-726-830-01	SCREW (M1.4X4) (THREE LOCK)	
258	X-3726-807-1	WORM ASSY	
259	3-726-826-01	GEAR, WHEEL	
260	3-726-829-01	WASHER, STOPPER	
261	3-728-842-01	LEVER, EJECT	
262	3-728-851-01	BRAKE, UL	
263	3-726-854-01	ARM, BRAKE RELEASE	
264	3-726-865-01	SPRING (LB), TORSION	
265	A-7040-130-A	GEAR BLOCK ASSY, LB	
266	X-3726-802-2	GEAR ASSY, RK	
267	X-3726-812-1	GEAR ASSY, RC	
268	3-321-393-11	WASHER, STOPPER	
269	X-3726-830-2	GEAR (LEFT) ASSY, DRIVE	
270	X-3726-831-2	GEAR (RIGHT) ASSY, DRIVE	
271	3-669-465-00	WASHER (1.5), STOPPER	
272	3-726-867-01	SPRING, LEAF	
273	3-701-436-21	WASHER, POLYEHTHYLENE	
274	3-726-857-02	ARM, UL	
275	3-726-856-02	GEAR, UL	
276	*3-726-805-01	REINFORCEMENT (TT)	
277	X-3726-808-2	BRAKE ASSY, TS	
278	X-3726-805-1	GEAR ASSY, JOINT	
279	3-728-866-11	BELT (S), TIMING	
280	X-3726-838-1	PULLEY (UPPER) ASSY, MIDWAY	
281	3-728-865-11	BELT (L), TIMING	
282	X-3728-846-1	LEVER ASSY, LOADING	
283	X-3726-824-1	ARM ASSY, PINCH SUB	
284	3-726-895-01	SPRING	
285	X-3726-841-1	REINFORCEMENT (SS) ASSY	
286	X-3728-810-1	ROLLER ASSY (U)(PLATING), GUIDE	
287	3-736-473-01	SCREW (M2X0.25) (THREE LOCK)	

5-8. LENS BLOCK ASSEMBLY


314
BTP2.0×3.5
BTP2.0×2.5
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P1.7×6.0
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(including ▲A)
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313
BTP1.7×3.5
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306
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307
BTP2.0×3.5
308
▲A (BTP 1.4×3.5)
317
302
BTP 1.7×3.5
BTP 1.4×4.0
301
BTP1.7×6.5
318
319
BTP1.7×6.5
BTP1.4×4.0
BTP1.7×5.0
305
BTP1.7×6.5
BTP1.7×5.0
304

No.	Part No.	Description	Remark
301	3-707-812-01	RING (F)	
302	3-707-801-01	RUBBER, STOPPER (F)	
303	3-707-808-01	TUBE ASSY	301, 302
304	3-707-805-01	SWITCH ASSY, AF	
305	3-707-806-01	BRACKET	
306	3-707-811-01	RING ASSY, ZOOM	
307	3-707-795-01	RUBBER, VIBRATION PROOF	
308	3-707-796-01	SCREW, FITTING (M)	
309	3-707-802-01	MOTOR ASSY, PZ GEAR (ZOOM)	
310	3-707-797-01	PIN	
311	3-707-798-01	CLAMP, PIN	
312	3-707-810-01	METER, IRIS (IRIS)	
313	3-707-809-01	FRAME ASSY, LENS	
314	3-707-807-01	TUBE ASSY, REAR	310-313
315	3-707-799-01	PLATE, LUG	
316	3-707-803-01	MOTOR ASSY, AF GEAR (FOCUS)	
317	3-707-800-01	TAPE	
318	3-707-804-01	PZ SWITCH ASSY	
319	3-707-568-01	ADAPTOR, LENS HOOD	
320	1-547-380-11	LENS, ZOOM (VCL-8508XB)	301-319

SECTION 6
ELECTRICAL PARTS LIST FP-89 FP-99 CO-2P

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- –XX, –X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, U : μ, for example:
  UA...: μA..., UPA...: μPA...,
  UPB...: μPB..., UPC...: μPC...,
  UPD...: μPD...
- CAPACITORS
  MF : μF, PF : μμF
- COILS
  MMH : mH, UH : μH

Ref.No	Part No.	Description		Remark
	1-628-060-12	FP-89 FLEXIBLE BOARD (Ref.No 6,000 Series) *********************		
	1-572-253-11	SWITCH, SLIDE (ENCODER)		
	3-728-869-02	HOLDER, SENSOR		
		DIODE		
D301	8-719-820-44	PHOTO COUPLER TLP907-0		
		TRANSISTOR		
Q301	8-729-906-48	TRANSISTOR EE-TP109		

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Ref.No	Part No.	Description		Remark
	1-628-061-12	FP-90 FLEXIBLE BOARD (Ref.No 8,000 Series) *********************		
	3-728-837-01	HOLDER, LED		
	3-728-869-02	HOLDER, SENSOR		
		DIODE		
D302	8-719-940-81	DIODE GL452S		
D303	8-719-820-44	PHOTO COUPLER TLP907-0		
		TRANSISTOR		
Q302	8-729-906-48	TRANSISTOR EE-TP109		
		SWITCH		
S302	1-571-680-11	SWITCH, PUSH (3 KEY) (REC PROOF/TAPE SELECT)		

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Ref.No	Part No.	Description		Remark
	*A-7061-599-A	CO-2P BOARD, COMPLETE (Ref.No 6,000 Series) ********************* (AEP, UK MODEL)		
	*A-7061-689-A	CO-2P BOARD, COMPLETE (Ref.No 6,000 Series) ********************* (Australian, E MODEL)		
		CAPACITOR		
C101	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C102	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C103	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C104	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C105	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C106	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C107	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C108	1-163-123-00	CERAMIC CHIP 180PF	5%	50V
C109	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C110	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C111	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C112	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C113	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C114	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C115	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C116	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C117	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C118	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C119	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C123	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C124	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C125	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C126	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C131	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C132	1-163-121-00	CERAMIC CHIP 150PF	5%	50V
C133	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C134	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C135	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C136	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C138	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C139	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C140	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C141	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C142	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C145	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C148	1-163-007-11	CERAMIC CHIP 680PF	10%	50V
C149	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C160	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C161	1-126-204-11	ELECT CHIP 47MF	20%	16V
C162	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C163	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C165	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C166	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C401	1-126-601-11	ELECT CHIP 2.2MF	20%	50V
C403	1-126-206-11	ELECT CHIP 100MF	20%	6.3V
C404	1-126-206-11	ELECT CHIP 100MF	20%	6.3V
C405	1-126-603-11	ELECT CHIP 4.7MF	20%	35V
C406	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C407	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C408	1-162-638-11	CERAMIC CHIP 1MF		16V
C409	1-126-206-11	ELECT CHIP 100MF	20%	6.3V
C410	1-126-207-11	ELECT CHIP 33MF	20%	4V
C411	1-126-207-11	ELECT CHIP 33MF	20%	4V
C412	1-162-638-11	CERAMIC CHIP 1MF	16V	(Australian, E)
C413	1-162-638-11	CERAMIC CHIP 1MF		16V
C414	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C415	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C416	1-163-019-00	CERAMIC CHIP 0.0068MF	10%	50V
C417	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C418	1-126-206-11	ELECT CHIP 100MF	20%	6.3V
C420	1-162-638-11	CERAMIC CHIP 1MF		16V
C421	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C501	1-124-779-00	ELECT CHIP 10MF	20%	16V
C503	1-163-095-00	CERAMIC CHIP 12PF	5%	50V
C504	1-163-095-00	CERAMIC CHIP 12PF	5%	50V
C505	1-163-038-00	CERAMIC CHIP 0.1MF		25V

CO-2P

Ref.No	Part No.	Description		Remark
C506	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C507	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C508	1-124-779-00	ELECT CHIP 10MF	20%	16V
C509	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C510	1-124-779-00	ELECT CHIP 10MF	20%	16V
C511	1-124-779-00	ELECT CHIP 10MF	20%	16V
C512	1-126-204-11	ELECT CHIP 47MF	20%	16V
C513	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C514	1-136-718-11	FILM CHIP 0.1MF	5%	25V
C515	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C516	1-124-779-00	ELECT CHIP 10MF	20%	16V
C517	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C518	1-126-601-11	ELECT CHIP 2.2MF	20%	50V
C519	1-124-779-00	ELECT CHIP 10MF	20%	16V
C520	1-124-779-00	ELECT CHIP 10MF	20%	16V
C521	1-126-193-11	ELECT CHIP 1MF	20%	50V
C522	1-126-193-11	ELECT CHIP 1MF	20%	50V
C523	1-124-779-00	ELECT CHIP 10MF	20%	16V
C524	1-126-193-11	ELECT CHIP 1MF	20%	50V
C525	1-124-779-00	ELECT CHIP 10MF	20%	16V
C526	1-126-204-11	ELECT CHIP 47MF	20%	16V
C527	1-127-506-81	ELECT(SOLID) 1MF	20%	25V
C528	1-126-602-11	ELECT CHIP 3.3MF	20%	50V
C529	1-124-779-00	ELECT CHIP 10MF	20%	16V
C530	1-163-077-00	CERAMIC CHIP 0.1MF	10%	25V
C531	1-163-077-00	CERAMIC CHIP 0.1MF	10%	25V
C532	1-163-077-00	CERAMIC CHIP 0.1MF	10%	25V
C533	1-124-779-00	ELECT CHIP 10MF	20%	16V
C534	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C535	1-124-779-00	ELECT CHIP 10MF	20%	16V
C536	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C537	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C538	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C539	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C540	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C541	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C542	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C543	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C544	1-162-638-11	CERAMIC CHIP 1MF		16V
C545	1-162-638-11	CERAMIC CHIP 1MF		16V
C546	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C548	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C549	1-163-081-00	CERAMIC CHIP 0.22MF		25V
C550	1-164-161-11	CERAMIC CHIP 0.0022MF		50V
C551	1-163-023-00	CERAMIC CHIP 0.015MF		50V
C552	1-162-638-11	CERAMIC CHIP 1MF		16V
C553	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C554	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C555	1-163-125-00	CERAMIC CHIP 220PF	10%	50V
C556	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C557	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C558	1-164-182-11	CERAMIC CHIP 0.0033MF	10%	50V
C559	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C560	1-162-638-11	CERAMIC CHIP 1MF		16V
C561	1-163-135-00	CERAMIC CHIP 560PF	5%	50V
C562	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C563	1-163-011-11	CERAMIC CHIP 0.0015MF	10%	50V
C564	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C565	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C566	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C567	1-164-005-11	CERAMIC CHIP 000004700MF		25V
C570	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C573	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C574	1-162-638-11	CERAMIC CHIP 1MF		16V
C576	1-162-638-11	CERAMIC CHIP 1MF		16V
C577	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C578	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C579	1-163-019-00	CERAMIC CHIP 0.0068MF	10%	50V
C580	1-162-638-11	CERAMIC CHIP 1MF		16V
C581	1-135-092-21	TANTAL. CHIP 3.3MF	20%	16V
C582	1-163-019-00	CERAMIC CHIP 0.0068MF	10%	50V
C590	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C591	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C617	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C621	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C622	1-163-123-00	CERAMIC CHIP 180PF	5%	50V
C623	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C624	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C625	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C626	1-127-489-81	ELECT(SOLID) 10MF	20%	10V
C627	1-124-638-11	ELECT 22MF	20%	10V
C628	1-163-095-00	CERAMIC CHIP 12PF	5%	50V
C629	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C630	1-127-489-81	ELECT(SOLID) 10MF	20%	10V
C631	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C632	1-164-247-11	CERAMIC CHIP 0.047MF	10%	16V
C633	1-135-149-21	TANTAL. CHIP 2.2MF	20%	6.3V

CONNECTOR

CN101	1-566-529-11	CONNECTOR, FPC (ZIF) 13P
CN102	*1-566-184-11	PIN, CONNECTOR (PC BOARD) 5P
CN501	1-566-529-11	CONNECTOR, FPC (ZIF) 13P
CN502	1-566-531-11	CONNECTOR, FPC (ZIF) 15P
CN503	1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P
CN504	1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P
CN505	*1-565-541-11	PIN, CONNECTOR (PC BOARD) 2P
CN506	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P
CN507	1-566-528-11	CONNECTOR, FPC (ZIF) 12P

DIODE

D401	8-719-106-09	DIODE RD6.2M-B3
D504	8-719-400-18	DIODE MA152WK
D505	8-719-400-18	DIODE MA152WK
D621	8-719-938-75	DIODE SB05-05CP
D622	8-719-938-75	DIODE SB05-05CP
D623	8-719-104-34	DIODE 1S2836

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
		FILTER	
FL401	1-236-145-11	FILTER, BAND PASS	
		IC	
IC101	8-752-033-38	IC CXA1202R	
IC401	8-741-150-51	IC SBX1505-21	
IC501	8-752-811-52	IC CXP80116-624Q	
IC502	8-759-990-78	IC S-81350AG-REG	
IC503	8-759-974-21	IC S-8054ALRS-LN	
IC504	8-759-804-72	IC LB1631M	
IC505	8-759-100-94	IC UPC358G2	
IC506	8-759-107-68	IC CX20115A	
IC507	8-759-202-45	IC CX20114	
IC508	8-759-805-06	IC CXA1127M	
IC509	8-759-209-53	IC CXA1204Q	
IC510	8-759-100-95	IC UPC324G2	
IC621	8-759-945-17	IC MB3775PF	
		COIL	
L101	1-408-777-00	INDUCTOR CHIP 10UH	
L102	1-412-033-11	INDUCTOR CHIP 220UH	
L103	1-412-029-11	INDUCTOR CHIP 10UH	
L104	1-412-033-11	INDUCTOR CHIP 220UH	
L105	1-412-033-11	INDUCTOR CHIP 220UH	
L106	1-412-033-11	INDUCTOR CHIP 220UH	
L107	1-412-033-11	INDUCTOR CHIP 220UH	
L501	1-412-031-11	INDUCTOR CHIP 47UH	
L502	1-412-031-11	INDUCTOR CHIP 47UH	
L503	1-408-795-21	INDUCTOR CHIP 330UH	
L504	1-412-032-11	INDUCTOR CHIP 100UH	
L505	1-412-030-11	INDUCTOR CHIP 22UH	
L506	1-412-032-11	INDUCTOR CHIP 100UH	
L621	1-410-690-11	COIL, CHOKE 22UH	
L622	1-410-626-11	COIL, CHOKE 47UH	
L623	1-410-626-11	COIL, CHOKE 47UH	
		IC LINK	
PS502⚠	1-532-605-00	LINK, IC ICP-N10	
PS503⚠	1-532-685-00	LINK, IC ICP-N20	
		TRANSISTOR	
Q102	8-729-100-66	TRANSISTOR 2SC1623	
Q108	8-729-901-06	TRANSISTOR DTA144EK	
Q109	8-729-100-66	TRANSISTOR 2SC1623	
Q110	8-729-100-66	TRANSISTOR 2SC1623	
Q112	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q113	8-729-902-21	TRANSISTOR 2SA1037K-T-146-R	
Q114	8-729-901-01	TRANSISTOR DTC144EK	
Q115	8-729-901-06	TRANSISTOR DTA144EK	
Q116	8-729-901-06	TRANSISTOR DTA144EK	
Q401	8-729-100-66	TRANSISTOR 2SC1623	

Ref.No	Part No.	Description	Remark
Q402	8-729-100-66	TRANSISTOR 2SC1623	
Q403	8-729-901-06	TRANSISTOR DTA144EK	
Q404	8-729-901-01	TRANSISTOR DTC144EK	
Q405	8-729-901-06	TRANSISTOR DTA144EK	
Q406	8-729-100-66	TRANSISTOR 2SC1623	
Q503	8-729-805-39	TRANSISTOR 2SC3898	
Q504	8-729-805-39	TRANSISTOR 2SC3898	
Q506	8-729-216-22	TRANSISTOR 2SA1162	
Q507	8-729-216-22	TRANSISTOR 2SA1162	
Q515	8-729-216-22	TRANSISTOR 2SA1162	
Q516	8-729-100-66	TRANSISTOR 2SC1623	
Q517	8-729-100-66	TRANSISTOR 2SC1623	
Q518	8-729-100-66	TRANSISTOR 2SC1623	
Q519	8-729-100-66	TRANSISTOR 2SC1623	
Q520	8-729-104-95	TRANSISTOR 2SB1040A-5	
Q521	8-729-100-66	TRANSISTOR 2SC1623	
Q522	8-729-216-22	TRANSISTOR 2SA1162	
Q524	8-729-100-66	TRANSISTOR 2SC1623	
Q525	8-729-100-66	TRANSISTOR 2SC1623	
Q526	8-729-216-22	TRANSISTOR 2SA1162	
Q527	8-729-100-66	TRANSISTOR 2SC1623	
Q528	8-729-216-22	TRANSISTOR 2SA1162	
Q529	8-729-100-66	TRANSISTOR 2SC1623	
Q530	8-729-216-22	TRANSISTOR 2SA1162	
Q531	8-729-216-22	TRANSISTOR 2SA1162	
Q532	8-729-216-22	TRANSISTOR 2SA1162	
Q533	8-729-216-22	TRANSISTOR 2SA1162	
Q534	8-729-901-01	TRANSISTOR DTC144EK	
Q535	8-729-901-01	TRANSISTOR DTC144EK	
Q536	8-729-805-39	TRANSISTOR 2SC3898	
Q537	8-729-216-22	TRANSISTOR 2SA1162	
Q538	8-729-100-66	TRANSISTOR 2SC1623	
Q539	8-729-100-66	TRANSISTOR 2SC1623	
Q540	8-729-100-66	TRANSISTOR 2SC1623	
Q621	8-729-901-00	TRANSISTOR DTC124EK	
Q622	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q623	8-729-805-25	TRANSISTOR 2SB1121	
Q624	8-729-901-01	TRANSISTOR DTC144EK	
Q625	8-729-901-04	TRANSISTOR DTA114EK	
Q626	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q627	8-729-805-25	TRANSISTOR 2SB1121	
Q628	8-729-100-66	TRANSISTOR 2SC1623	
Q629	8-729-100-66	TRANSISTOR 2SC1623	
		RESISTOR	
R102	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R103	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R104	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R106	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R110	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R113	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R114	1-216-083-00	METAL GLAZE 27K 5% 1/10W	
R115	1-216-081-00	METAL GLAZE 22K 5% 1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

CO-2P

Ref.No	Part No.	Description				Remark
R116	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R117	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R118	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R119	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R120	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R121	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R122	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R123	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R124	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R125	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R126	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R127	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R128	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R129	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R130	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R131	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R132	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R133	1-216-009-00	METAL GLAZE	22	5%	1/10W	
R134	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R135	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R136	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R137	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R139	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R140	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R141	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R143	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R150	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R151	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R155	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R156	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R157	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R158	1-216-039-00	METAL GLAZE	390	5%	1/10W	
R160	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R161	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R401	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R402	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R403	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R404	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R405	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R407	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R408	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R409	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R410	1-216-011-00	METAL GLAZE	27	5%	1/10W	
R411	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R415	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R416	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R417	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R418	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	(Australian, E)
R419	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	(Australian, E)
R421	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R422	1-216-049-00	METAL GLAZE	1K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R423	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R430	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R431	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R501	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R502	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R503	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R504	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R505	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R506	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R507	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R508	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R509	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R510	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R511	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R512	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R513	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R514	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R515	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R516	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R517	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R518	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R519	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R520	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R521	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R522	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R523	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R524	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R525	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R526	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R528	1-216-117-00	METAL GLAZE	680K	5%	1/10W	
R530	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R531	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R532	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R533	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R534	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R535	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R536	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R537	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R538	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R539	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R540	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R541	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R542	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R543	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R544	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R545	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R546	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R547	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R548	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R549	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R550	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R551	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R552	1-216-105-00	METAL GLAZE	220K	5%	1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R553	1-216-106-00	METAL GLAZE	240K	5%	1/10W	
R554	1-216-182-00	METAL GLAZE	220	5%	1/8W	
R555	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R556	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R557	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R558	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R559	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R560	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R561	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R562	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R563	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R564	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R565	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R566	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R567	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R568	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R570	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R571	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R572	1-216-115-00	METAL GLAZE	560K	5%	1/10W	
R574	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R575	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R576	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R577	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R578	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R579	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R580	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R581	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R582	1-216-298-00	METAL GLAZE	2.2	5%	1/10W	
R583	1-216-298-00	METAL GLAZE	2.2	5%	1/10W	
R584	1-216-298-00	METAL GLAZE	2.2	5%	1/10W	
R585	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R586	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R587	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R588	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R589	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R590	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R591	1-216-031-00	METAL GLAZE	180	5%	1/10W	
R592	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R593	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R594	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R595	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R596	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R597	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R598	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R599	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R600	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R601	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R602	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R603	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R604	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R605	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R606	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R607	1-216-025-00	METAL GLAZE	100	5%	1/10W	

Ref.No	Part No.	Description				Remark
R608	1-216-027-00	METAL GLAZE	120	5%	1/10W	
R609	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R610	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R611	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R612	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R613	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R614	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R615	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R616	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R617	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R618	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R619	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R620	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R621	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R622	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R623	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R624	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R625	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R626	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R627	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R628	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R629	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R630	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R631	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R632	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R633	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R634	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R635	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R636	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R637	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R638	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R639	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R640	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R641	1-216-136-00	METAL GLAZE	2.7	5%	1/8W	
R642	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R643	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R644	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R645	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R652	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R653	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R654	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R655	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R656	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R659	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R660	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R661	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R663	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R664	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R665	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R666	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R667	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R668	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R669	1-216-049-00	METAL GLAZE	1K	5%	1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R670	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R681	1-216-097-00	METAL GLAZE 100K 5% 1/10W	

VARIABLE RESISTOR

RV101	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV102	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV501	1-230-874-11	RES, ADJ, METAL GLAZE 100K
RV551	1-238-225-11	RES, ADJ, METAL GLAZE 47K
RV621	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K

CONNECTOR

W501	1-574-451-11	CABLE, FLAT (1.0MM PITCH) 22P
W502	1-574-451-11	CABLE, FLAT (1.0MM PITCH) 22P

CRYSTAL

X501	1-577-116-11	VIBRATOR, CRYSTAL (16MHz)
X502	1-567-699-11	VIBRATOR, CRYSTAL (5.9MHz)

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*A-7061-606-A LI-10 BOARD, COMPLETE (Ref.No 3,000 Series)
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CAPACITOR

C901	1-163-115-00	CERAMIC CHIP 82PF 5% 50V
C902	1-163-125-00	CERAMIC CHIP 220PF 5% 50V
C903	1-163-095-00	CERAMIC CHIP 12PF 5% 50V
C904	1-124-778-00	ELECT CHIP 22MF 20% 6.3V
C905	1-164-232-11	CERAMIC CHIP 0.01MF 50V
C907	1-162-638-11	CERAMIC CHIP 1MF 16V
C908	1-164-232-11	CERAMIC CHIP 0.01MF 50V
C910	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V
C911	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V
C912	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V
C914	1-163-091-00	CERAMIC CHIP 8PF 0.25PF 50V
C916	1-162-638-11	CERAMIC CHIP 1MF 16V
C918	1-162-638-11	CERAMIC CHIP 1MF 16V

TRIMMER

CV901	1-141-368-11	CAP, CHIP TRIMMER (30P)

DIODE

D901	8-713-300-88	DIODE 1T33C-01

IC

IC901	8-759-101-12	IC UPC311G2
IC902	8-759-983-54	IC MB87485
IC903	8-759-945-09	IC MB8464-12LLPF

COIL

Ref.No	Part No.	Description	Remark
L901	1-410-377-31	INDUCTOR CHIP 4.7UH	
L902	1-410-384-31	INDUCTOR CHIP 18UH	
L903	1-410-369-11	INDUCTOR CHIP 1UH	
L904	1-410-377-31	INDUCTOR CHIP 4.7UH	

TRANSISTOR

Q901	8-729-100-66	TRANSISTOR 2SC1623
Q902	8-729-100-66	TRANSISTOR 2SC1623
Q903	8-729-216-22	TRANSISTOR 2SA1162
Q904	8-729-901-01	TRANSISTOR DTC144EK

RESISTOR

R901	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R902	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R903	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R904	1-216-055-00	METAL GLAZE 1.8K 5% 1/10W
R905	1-216-089-00	METAL GLAZE 47K 5% 1/10W
R906	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W
R907	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W
R908	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W
R909	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R910	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W
R911	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R912	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W
R913	1-216-073-00	METAL GLAZE 10K 5% 1/10W
R914	1-216-073-00	METAL GLAZE 10K 5% 1/10W
R915	1-216-097-00	METAL GLAZE 100K 5% 1/10W
R916	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W
R917	1-216-073-00	METAL GLAZE 10K 5% 1/10W
R918	1-216-097-00	METAL GLAZE 100K 5% 1/10W
R940	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R941	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W
R942	1-216-037-00	METAL GLAZE 330 5% 1/10W

CONNECTOR

W802	1-574-471-11	CABLE, FLAT (1.0MM PITCH) 23P

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*A-7061-609-A VF-14P BOARD, COMPLETE (Ref.No 7,000 Series)
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*3-674-372-00 HOLDER (A), LED

CAPACITOR

C901	1-124-442-00	ELECT 330MF 20% 6.3V
C903	1-163-077-00	CERAMIC CHIP 0.1MF 50V
C904	1-126-160-11	ELECT 1MF 20% 50V
C905	1-163-037-11	CERAMIC CHIP 0.022MF 10% 25V
C906	1-131-387-41	TANTALUM 47MF 10% 6.3V
C907	1-162-638-11	CERAMIC CHIP 1MF 16V
C908	1-136-165-00	FILM 0.1MF 5% 50V
C909	1-163-105-00	CERAMIC CHIP 33PF 5% 50V
C910	1-124-587-11	ELECT 220MF 20% 6.3V
C911	1-163-141-00	CERAMIC CHIP 0.001MF 5% 50V
C912 ⚠	1-162-625-11	CERAMIC CHIP 0.0047MF 5% 50V

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C913 ⚠	1-162-625-11	CERAMIC CHIP	0.0047MF	5%	50V
C914 ⚠	1-163-209-00	CERAMIC CHIP	0.0015MF	5%	50V
C915	1-126-090-11	ELECT	82MF	20%	10V
C916	1-126-094-11	ELECT	4.7MF	20%	35V
C918	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C919	1-102-038-00	CERAMIC	0.001MF		500V
		CONNECTOR			
CN902	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P			
CN903	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P			
CN904	*1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P			
		DIODE			
D903	8-719-400-20	DIODE MA152WA			
		IC			
IC901	8-759-420-01	IC AN2512S			
		COIL			
L901	1-410-831-21	INDUCTOR	82UH		
L902	1-408-976-21	INDUCTOR	33UH		
L903 ⚠	1-459-876-21	COIL, FERRITE (HLC)			
		TRANSISTOR			
Q903	8-729-216-31	TRANSISTOR 2SA1163G			
Q904	8-729-100-66	TRANSISTOR 2SC1623			
Q905 ⚠	8-729-106-68	TRANSISTOR 2SD1615A-GP			
		RESISTOR			
R903	1-216-041-00	METAL GLAZE	470	5%	1/10W
R905	1-216-007-00	METAL GLAZE	18	5%	1/10W
R906	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R908	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R909	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R910	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R911	1-216-013-00	METAL GLAZE	33	5%	1/10W
R912	1-216-691-11	METAL CHIP	47K	0.50%	1/10W
R913	1-216-107-00	METAL GLAZE	270K	1%	1/10W
R914	1-216-025-00	METAL GLAZE	100	5%	1/10W
R915	1-216-306-11	METAL GLAZE	3.9	5%	1/10W
R917	1-216-047-00	METAL GLAZE	820	5%	1/10W
R918	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W
R919	1-216-748-11	METAL GLAZE	39K	5%	1/10W
R920	1-216-748-11	METAL GLAZE	39K	5%	1/10W
R921	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R922	1-216-101-00	METAL GLAZE	150K	5%	1/10W
R923	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R924	1-216-131-11	METAL GLAZE	2.7M	5%	1/10W
R925	1-216-131-11	METAL GLAZE	2.7M	5%	1/10W
R926	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W
R927	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R928	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W

Ref.No	Part No.	Description			Remark
R929	1-216-047-00	METAL GLAZE	820	5%	1/10W
R930	1-216-041-00	METAL GLAZE	470	5%	1/10W
R931	1-216-041-00	METAL GLAZE	470	5%	1/10W
R932	1-216-047-00	METAL GLAZE	820	5%	1/10W
R933	1-216-121-00	METAL GLAZE	1M	5%	1/10W
		VARIABLE RESISTOR			
RV901	1-230-873-11	RES, ADJ, METAL GLAZE 47K			
RV902	1-230-866-11	RES, ADJ, METAL GLAZE 470			
RV904	1-228-762-00	RES, ADJ, METAL GLAZE 1M			
		TRANSFORMER			
T901 ⚠	1-439-431-11	TRANSFORMER ASSY, FLYBACK			
		THERMISTOR			
TH901	1-807-938-11	THERMISTOR			
		SOCKET			
W901	1-540-019-21	SOCKET ASSY, CRT			

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*1-629-384-21 LD-13P BOARD (Ref.No 8,000 Series)
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		DIODE	
D901	8-719-941-34	DIODE GL1HD51	
D902	8-719-812-41	DIODE TLR124	

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*A-7061-951-A CD-17P BOARD, COMPLETE (Ref.No 1,000 Series)
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	3-831-441-XX	CUSHION			
		CAPACITOR			
C601	1-126-193-11	ELECT CHIP	1MF	20%	50V
C602	1-126-607-11	ELECT CHIP	47MF	20%	4V
C603	1-126-602-11	ELECT CHIP	3.3MF	20%	50V
C604	1-126-602-11	ELECT CHIP	3.3MF	20%	50V
C606	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V
C607	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V
C608	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C610	1-135-145-11	TANTAL. CHIP	0.47MF	20%	25V
C611	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V
C612	1-163-016-00	CERAMIC CHIP	0.0039MF	10%	50V
C613	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C614	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C615	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C617	1-163-023-00	CERAMIC CHIP	0.015MF	10%	50V
C619	1-126-405-11	ELECT CHIP	10MF	20%	50V
C620	1-163-036-00	CERAMIC CHIP	0.068MF		50V
C621	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
C630	1-162-638-11	CERAMIC CHIP 1MF	16V
C631	1-163-117-00	CERAMIC CHIP 100PF 5%	50V
C632	1-163-117-00	CERAMIC CHIP 100PF 5%	50V

CONNECTOR

Ref.No	Part No.	Description	Remark
CN601	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN602	*1-566-196-11	PIN, CONNECTOR (PC BOARD) 3P	
CN603	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P	
CN604	*1-566-198-11	PIN, CONNECTOR (PC BOARD) 5P	
CN605	*1-566-201-11	PIN, CONNECTOR (PC BOARD) 8P	

DIODE

Ref.No	Part No.	Description	Remark
D601	8-719-104-31	DIODE MA152WK	
D602	8-719-104-34	DIODE 1S2836	
D603	8-719-104-31	DIODE MA152WK	
D604	8-719-104-31	DIODE MA152WK	

IC

Ref.No	Part No.	Description	Remark
IC601	A-7091-132-A	ICX027BK-2 ASSY (CCD IMAGER)	

COIL

Ref.No	Part No.	Description	Remark
L601	1-410-393-11	INDUCTOR CHIP 100UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q601	8-729-105-53	TRANSISTOR 2SK300-3	
Q602	8-729-100-66	TRANSISTOR 2SC1623	
Q603	8-729-100-66	TRANSISTOR 2SC1623	
Q604	8-729-100-66	TRANSISTOR 2SC1623	
Q605	8-729-100-66	TRANSISTOR 2SC1623	
Q606	8-729-216-22	TRANSISTOR 2SA1162	
Q607	8-729-104-26	TRANSISTOR 2SB804-AW	
Q608	8-729-103-72	TRANSISTOR 2SD1005-BV	
Q609	8-729-216-22	TRANSISTOR 2SA1162	
Q610	8-729-100-66	TRANSISTOR 2SC1623	

RESISTOR

Ref.No	Part No.	Description	Remark
R601	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R602	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R603	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R604	1-216-075-00	METAL GLAZE 12K 5% 1/10W	
R605	1-216-079-00	METAL GLAZE 18K 5% 1/10W	
R606	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R607	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R608	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R609	1-216-091-00	METAL GLAZE 56K 5% 1/10W	
R610	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R611	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R612	1-216-095-00	METAL GLAZE 82K 5% 1/10W	
R613	1-216-095-00	METAL GLAZE 82K 5% 1/10W	
R614	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R615	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R616	1-216-005-00	METAL GLAZE 15 5% 1/10W	
R617	1-216-005-00	METAL GLAZE 15 5% 1/10W	
R618	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R619	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R620	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R621	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R622	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R630	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R631	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R632	1-216-095-00	METAL GLAZE 82K 5% 1/10W	
R633	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R634	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R635	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R636	1-216-295-00	METAL GLAZE 0 5% 1/10W	

CONNECTOR

Ref.No	Part No.	Description	Remark
W601	1-575-151-11	CABLE, FLAT (1.0MM PITCH)	
W603	1-575-063-11	CABLE, FLAT (1.0MM PITCH) 14P	

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*1-631-828-21 VK-3P BOARD (Ref.No 9,000 Series)
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CONNECTOR

Ref.No	Part No.	Description	Remark
CN508	*1-566-182-11	PIN, CONNECTOR (PC BOARD) 3P	

DIODE

Ref.No	Part No.	Description	Remark
D501	8-719-104-31	DIODE MA152WK	
D502	8-719-104-34	DIODE 1S2836	
D503	8-719-104-34	DIODE 1S2836	
D504	8-719-801-41	DIODE 1SS196	
D505	8-719-104-31	DIODE MA152WK (AEP, UK MODEL)	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q501	8-729-903-30	TRANSISTOR DTC144TK	
Q502	8-729-903-30	TRANSISTOR DTC144TK	

SWITCH

Ref.No	Part No.	Description	Remark
S501	1-571-101-12	SWITCH, SLIDE (POWER)	
S502	1-572-078-11	SWITCH, TACTILE (REW◀◀)	
S503	1-572-078-11	SWITCH, TACTILE (▷ PB)	
S504	1-572-078-11	SWITCH, TACTILE (FF ▶▶)	
S505	1-572-078-11	SWITCH, TACTILE (□ STOP)	
S506	1-572-078-11	SWITCH, TACTILE (❚❚ PAUSE)	
S507	1-571-102-21	SWITCH, SLIDE (REC)(Australian, E MODEL)	
S508	1-571-102-11	SWITCH, SLIDE (EJECT)	
S509	1-572-078-11	SWITCH, TACTILE (DATA SCREEN)	
S510	1-553-977-00	SWITCH, SLIDE (EDIT)	

CONNECTOR

Ref.No	Part No.	Description	Remark
W507	1-574-471-11	CABLE, FLAT (1.0MM PITCH) 12P	

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When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
	*A-7061-953-A	CC-26P BOARD, COMPLETE (Ref.No 7,000 Series) ***********************	
		CAPACITOR	
C001	1-162-638-11	CERAMIC CHIP 1MF	16V
C002	1-162-638-11	CERAMIC CHIP 1MF	16V
C003	1-163-038-00	CERAMIC CHIP 0.1MF	25V
		CONNECTOR	
CN001	1-566-529-11	CONNECTOR, FPC (ZIF) 13P	
CN002	1-566-527-11	CONNECTOR, FPC (ZIF) 11P	
		DIODE	
D001	8-719-104-31	DIODE MA152WK	
D002	8-719-104-31	DIODE MA152WK	
D003	8-719-104-31	DIODE MA152WK	
		IC	
IC001	8-759-100-93	IC UPC393G2	
		TRANSISTOR	
Q002	8-729-903-30	TRANSISTOR DTC144TK	
Q004	8-729-903-30	TRANSISTOR DTC144TK	
Q005	8-729-903-30	TRANSISTOR DTC144TK	
Q006	8-729-900-53	TRANSISTOR DTC114EK	
		RESISTOR	
R001	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W
R002	1-216-109-00	METAL GLAZE 330K 5%	1/10W
R003	1-216-109-00	METAL GLAZE 330K 5%	1/10W
R004	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R005	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R006	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R007	1-216-174-00	METAL GLAZE 100 5%	1/8W
R008	1-216-041-00	METAL GLAZE 470 5%	1/10W
R009	1-216-121-00	METAL GLAZE 1M 5%	1/10W
R010	1-216-121-00	METAL GLAZE 1M 5%	1/10W
R011	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R012	1-216-109-00	METAL GLAZE 330K 5%	1/10W
R013	1-216-109-00	METAL GLAZE 330K 5%	1/10W
R014	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W
R015	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R016	1-216-097-00	METAL GLAZE 100K 5%	1/10W
		CONNECTOR	
W501	1-574-471-11	CABLE, FLAT (1.0MM PITCH) 13P	

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Ref.No	Part No.	Description	Remark
	*A-7061-954-A	CK-19P BOARD, COMPLETE (Ref.No 4,000 Series) ***********************	
	3-712-410-01	HOLDER, RS	
		CAPACITOR	
C651	1-163-093-00	CERAMIC CHIP 10PF 5%	50V
C652	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C654	1-163-105-00	CERAMIC CHIP 33PF 5%	50V
C655	1-135-149-21	TANTAL. CHIP 2.2MF 20%	10V
C656	1-135-149-21	TANTAL. CHIP 2.2MF 20%	10V
C657	1-135-157-21	TANTAL. CHIP 10MF 20%	6.3V
C658	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C659	1-162-638-11	CERAMIC CHIP 1MF	16V
C660	1-163-989-11	CERAMIC CHIP 0.033MF 10%	25V
		TRIMMER	
CV651	1-141-368-11	CAP, CHIP TRIMMER (30P)	
		DIODE	
D651	8-719-938-72	DIODE SB01-05CP	
D652	8-719-400-18	DIODE MA152WK	
D653	8-719-400-18	DIODE MA152WK	
D654	8-719-400-18	DIODE MA152WK	
D655	8-719-400-18	DIODE MA152WK	
D656	8-719-400-18	DIODE MA152WK	
D657	8-719-400-18	DIODE MA152WK	
D658	8-719-400-18	DIODE MA152WK	
D660	8-719-939-11	DIODE GP2S09-B	
		IC	
IC651	8-759-147-08	IC UPD7508BGB-512	
		COIL	
L651	1-410-391-11	INDUCTOR CHIP 68UH	
		TRANSISTOR	
Q651	8-729-901-03	TRANSISTOR DTC144WK	
Q652	8-729-216-22	TRANSISTOR 2SA1162	
Q653	8-729-901-03	TRANSISTOR DTC144WK	
Q654	8-729-220-93	TRANSISTOR 2SK209G	
Q655	8-729-216-22	TRANSISTOR 2SA1162	
Q656	8-729-216-22	TRANSISTOR 2SA1162	
Q657	8-729-216-22	TRANSISTOR 2SA1162	
Q658	8-729-100-66	TRANSISTOR 2SC1623	
Q659	8-729-100-66	TRANSISTOR 2SC1623	
Q660	8-729-216-22	TRANSISTOR 2SA1162	
Q661	8-729-216-22	TRANSISTOR 2SA1162	
Q662	8-729-902-XX	TRANSISTOR DTC114TK	
Q663	8-729-902-XX	TRANSISTOR DTC114TK	
Q664	8-729-216-22	TRANSISTOR 2SA1162	
Q665	8-729-901-01	TRANSISTOR DTC144EK	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R651	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R652	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R653	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R654	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R655	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R656	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R657	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R658	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R659	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R660	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R661	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R662	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R663	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R664	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R665	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R666	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R667	1-216-129-00	METAL GLAZE	2.2M	5%	1/10W	
R668	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R669	1-216-105-00	METAL GLAZE	220K	5%	1/10W	
R670	1-216-246-00	METAL GLAZE	100K	5%	1/8W	
R671	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R672	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R673	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R674	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R675	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R676	1-216-103-00	METAL GLAZE	180K	5%	1/10W	
R677	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R678	1-218-167-11	METAL GLAZE	330K	1%	1/10W	
R679	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R680	1-218-167-11	METAL GLAZE	330K	1%	1/10W	
R681	1-216-336-11	METAL GLAZE	47K	1%	1/10W	
R682	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R683	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R684	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R685	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R686	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R687	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R688	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R689	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R690	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R691	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R692	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R693	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R695	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R696	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R697	1-216-296-00	METAL GLAZE	0	5%	1/8W	
R698	1-216-296-00	METAL GLAZE	0	5%	1/8W	
R699	1-216-296-00	METAL GLAZE	0	5%	1/8W	
R700	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R701	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R702	1-216-296-00	METAL GLAZE	0	5%	1/8W	
R703	1-216-296-00	METAL GLAZE	0	5%	1/8W	
R704	1-216-295-00	METAL GLAZE	0	5%	1/10W	

Ref.No	Part No.	Description				Remark
R705	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R706	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R707	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R708	1-216-296-00	METAL GLAZE	0	5%	1/8W	
R709	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R711	1-216-295-00	METAL GLAZE	0	5%	1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV651	1-230-874-11	RES, ADJ, METAL GLAZE 100K

SWITCH

Ref.No	Part No.	Description
S652	1-572-078-11	SWITCH, TACTILE (SUTTER SPEED)
S653	1-572-078-11	SWITCH, TACTILE (BACK LIGHT)
S654	1-572-078-11	SWITCH, TACTILE (WHITE BAL)
S655	1-572-078-11	SWITCH, TACTILE (FOCUS)
S656	1-572-078-11	SWITCH, TACTILE (COLOR/MODE)
S657	1-572-078-11	SWITCH, TACTILE (MEMORY)
S658	1-572-078-11	SWITCH, TACTILE (SUPERIMPOSE ON/OFF)
S659	1-572-078-11	SWITCH, TACTILE (TIME NEXT)
S660	1-572-078-11	SWITCH, TACTILE (DATE +)

CRYSTAL

Ref.No	Part No.	Description
X651	1-527-997-21	VIBRATOR, CRYSTAL (32.768KHz)

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*1-631-825-21 DK-4P BOARD (Ref.No 5,000 Series)

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DIODE

Ref.No	Part No.	Description
D691	8-719-400-18	DIODE MA152WK
D692	8-719-400-18	DIODE MA152WK

SWITCH

Ref.No	Part No.	Description
S691	1-572-078-11	SWITCH, TACTILE (EDITSEARCH +)
S692	1-572-078-11	SWITCH, TACTILE (EDIT SEARCH -)
S693	1-572-078-11	SWITCH, TACTILE (COUNTER RESET)
S694	1-572-078-11	SWITCH, TACTILE (ZERO MEMO)

CONNECTOR

Ref.No	Part No.	Description
W652	1-575-062-11	CABLE, FLAT (1.0MM PITCH) 6P

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When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
	*A-7061-957-A	CV-9 BOARD, COMPLETE (Ref.No 2,000 Series) ********************* (AEP, UK MODEL)			
	*A-7062-054-A	CV-9 BOARD, COMPLETE (Ref.No 2,000 Series) ********************* (Australian, E MODEL)			
	A-7068-128-A	MX-7 BOARD, COMPLETE (HIC)			
	A-7068-161-A	DT-79D BOARD, COMPLETE (HIC) (AEP(TYPE 1), Australian, E MODEL)			
	A-7068-162-A	DT-79A BOARD, COMPLETE (HIC) (AEP(TYPE 2), UK MODEL)			
		CAPACITOR			
C201	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C202	1-124-779-00	ELECT CHIP	10MF	20%	16V
C203	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C204	1-124-779-00	ELECT CHIP	10MF	20%	16V
C205	1-162-638-11	CERAMIC CHIP	1MF		16V
C206	1-124-779-00	ELECT CHIP	10MF	20%	16V
C209	1-126-205-11	ELECT CHIP	47MF	20%	6.3V
C210	1-162-638-11	CERAMIC CHIP	1MF	16V	(Australian, E)
C211	1-164-247-11	CERAMIC CHIP	0.047MF	10%	16V
C212	1-162-638-11	CERAMIC CHIP	1MF		16V
C213	1-124-779-00	ELECT CHIP	10MF	20%	16V
C214	1-126-246-11	ELECT CHIP	220MF	20%	4V
C215	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C216	1-124-779-00	ELECT CHIP	10MF	20%	16V
C217	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C218	1-162-638-11	CERAMIC CHIP	1MF		16V
C219	1-126-193-11	ELECT CHIP	1MF	20%	50V
C220	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C221	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C223	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C224	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C225	1-162-638-11	CERAMIC CHIP	1MF		16V
C226	1-163-077-00	CERAMIC CHIP	0.1MF	10%	25V
C227	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C228	1-135-180-21	TANTAL. CHIP	3.3MF	20%	6.3V
C229	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C230	1-162-638-11	CERAMIC CHIP	1MF		16V
C231	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C232	1-135-180-21	TANTAL. CHIP	3.3MF	20%	6.3V
C233	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C234	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C235	1-162-638-11	CERAMIC CHIP	1MF		16V
C236	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C237	1-162-638-11	CERAMIC CHIP	1MF		16V
C238	1-135-180-21	TANTAL. CHIP	3.3MF	20%	6.3V
C239	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C240	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C241	1-162-638-11	CERAMIC CHIP	1MF		16V
C242	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C243	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C245	1-126-100-11	ELECT	10MF	20%	6.3V
C246	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C247	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C248	1-124-779-00	ELECT CHIP	10MF	20%	16V
C249	1-124-779-00	ELECT CHIP	10MF	20%	16V
C250	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C251	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C252	1-124-779-00	ELECT CHIP	10MF	20%	16V
C253	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C254	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C257	1-124-779-00	ELECT CHIP	10MF	20%	16V
C258	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C259	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C260	1-124-779-00	ELECT CHIP	10MF	20%	16V
C265	1-124-779-00	ELECT CHIP	10MF	20%	16V
C269	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C270	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C271	1-163-089-00	CERAMIC CHIP	6PF	0.25PF	50V
C273	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C274	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C275	1-163-095-00	CERAMIC CHIP	12PF	5%	50V
C276	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C277	1-162-638-11	CERAMIC CHIP	1MF		16V
C278	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C279	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C280	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C281	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C287	1-124-287-00	ELECT	10MF	20%	10V
C288	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C289	1-124-779-00	ELECT CHIP	10MF	20%	16V
C291	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C292	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C293	1-163-095-00	CERAMIC CHIP	12PF	5%	50V
C294	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C295	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C296	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C298	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C300	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V
C301	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C302	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C304	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C305	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C306	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C307	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C308	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C309	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C310	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C311	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C312	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C313	1-163-117-00	CERAMIC CHIP	100PF	5%	50V

When indicating parts by reference number, please include the board name.

CV-9

Ref.No	Part No.	Description		Remark
C314	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C315	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C316	1-163-115-00	CERAMIC CHIP 82PF	5%	50V
C317	1-164-182-11	CERAMIC CHIP 0.0033MF	10%	50V
C327	1-163-103-00	CERAMIC CHIP 27PF	5%	50V
C333	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C334	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C336	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C343	1-163-118-00	CERAMIC CHIP 110PF	5%	50V
C350	1-163-119-00	CERAMIC CHIP 120PF	5%	50V
C357	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C360	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C374	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C401	1-163-111-00	CERAMIC CHIP 56PF	5%	50V
C402	1-124-779-00	ELECT CHIP 10MF	20%	16V
C403	1-163-127-00	CERAMIC CHIP 270PF	5%	50V
C404	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C407	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C409	1-163-123-00	CERAMIC CHIP 180PF	5%	50V
C411	1-163-118-00	CERAMIC CHIP 110PF	5%	50V
C413	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C414	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C415	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C416	1-163-099-00	CERAMIC CHIP 18PF	5%	50V
C417	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C418	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C419	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C451	1-162-638-11	CERAMIC CHIP 1MF		16V
C452	1-162-638-11	CERAMIC CHIP 1MF		16V
C501	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C502	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C503	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C504	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C505	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C506	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C507	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C508	1-124-779-00	ELECT CHIP 10MF	20%	16V
C509	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C510	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C511	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C512	1-163-123-00	CERAMIC CHIP 180PF	5%	50V
C513	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C514	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C515	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C516	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C517	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C601	1-135-145-11	TANTAL. CHIP 0.47MF	20%	25V
C602	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C603	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C604	1-162-638-11	CERAMIC CHIP 1MF		16V
C605	1-162-638-11	CERAMIC CHIP 1MF		16V
C606	1-163-100-00	CERAMIC CHIP 20PF	5%	50V
C607	1-163-118-00	CERAMIC CHIP 110PF	5%	50V
C608	1-163-114-00	CERAMIC CHIP 75PF	5%	50V
C609	1-163-100-00	CERAMIC CHIP 20PF	5%	50V
C610	1-163-118-00	CERAMIC CHIP 110PF	5%	50V
C611	1-163-114-00	CERAMIC CHIP 75PF	5%	50V
C612	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C613	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C614	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C615	1-163-097-00	CERAMIC CHIP 15PF	5%	50V
C616	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C617	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C618	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C619	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C621	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C622	1-163-095-00	CERAMIC CHIP 12PF	5%	50V
C623	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C624	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C626	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C627	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C628	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C629	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C631	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C632	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C636	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C637	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C638	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C639	1-124-779-00	ELECT CHIP 10MF	20%	16V
C640	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C641	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C642	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C647	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C648	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C650	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C651	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C652	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C653	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C654	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C655	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C656	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C658	1-162-638-11	CERAMIC CHIP 1MF		16V
C660	1-162-638-11	CERAMIC CHIP 1MF		16V
C661	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C662	1-162-638-11	CERAMIC CHIP 1MF		16V
C665	1-162-638-11	CERAMIC CHIP 1MF		16V
C666	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C669	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C673	1-163-131-00	CERAMIC CHIP 390PF	5%	50V
C675	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C676	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C677	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C678	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C679	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C681	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C683	1-163-038-00	CERAMIC CHIP 0.1MF		25V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
C684	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C685	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C686	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C687	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C689	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C690	1-164-005-11	CERAMIC CHIP 000004700MF		25V
C691	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C692	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C693	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C694	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C695	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C696	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C697	1-163-111-00	CERAMIC CHIP 56PF	5%	50V
C699	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C700	1-162-638-11	CERAMIC CHIP 1MF		16V
C701	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C702	1-162-638-11	CERAMIC CHIP 1MF		16V
C703	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C704	1-124-566-11	ELECT 120MF	20%	6.3V
C705	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C706	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C707	1-135-145-11	TANTAL. CHIP 0.47MF	20%	25V
C708	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C709	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C710	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C712	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C713	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C714	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C715	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C716	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C718	1-126-602-11	ELECT CHIP 3.3MF	20%	50V
C719	1-135-072-21	TANTAL. CHIP 0.22MF	20%	35V
C721	1-124-779-00	ELECT CHIP 10MF	20%	16V
C722	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C723	1-126-602-11	ELECT CHIP 3.3MF	20%	50V
C724	1-126-602-11	ELECT CHIP 3.3MF	20%	50V
C725	1-162-638-11	CERAMIC CHIP 1MF		16V
C726	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C727	1-126-602-11	ELECT CHIP 3.3MF	20%	50V
C729	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C730	1-162-638-11	CERAMIC CHIP 1MF		16V
C731	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C735	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C736	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C741	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C798	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C799	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C801	1-124-779-00	ELECT CHIP 10MF	20%	16V
C802	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C803	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C804	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C805	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C806	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C807	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C808	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C809	1-163-115-00	CERAMIC CHIP 82PF	5%	50V
C810	1-163-119-00	CERAMIC CHIP 120PF	5%	50V
C811	1-163-125-00	CERAMIC CHIP 220PF	5%	50V
C812	1-163-125-00	CERAMIC CHIP 220PF	5%	50V
C813	1-162-638-11	CERAMIC CHIP 1MF		16V
C814	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C815	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C817	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C818	1-162-638-11	CERAMIC CHIP 1MF		16V
C819	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C820	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C821	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C822	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C824	1-162-638-11	CERAMIC CHIP 1MF		16V
C825	1-162-637-11	CERAMIC CHIP 0.47MF		16V
C826	1-162-637-11	CERAMIC CHIP 0.47MF		16V
C827	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C828	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C829	1-163-125-00	CERAMIC CHIP 220PF	5%	50V
C830	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C832	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C835	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C836	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C837	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C838	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C839	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C840	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C841	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C842	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C843	1-124-779-00	ELECT CHIP 10MF	20%	16V
C844	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C845	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C846	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C848	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C849	1-164-005-11	CERAMIC CHIP 0.47MF		25V

CONNECTOR

Ref.No	Part No.	Description
CN501	1-568-165-11	CONNECTOR, FPC (1.0MM)(ZIF)22P
CN502	1-568-165-11	CONNECTOR, FPC (1.0MM)(ZIF)22P
CN601	1-566-547-11	CONNECTOR, FPC (NON ZIF) 15P
CN602	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P
CN801	1-566-530-11	CONNECTOR, FPC (ZIF) 14P
CN802	1-568-207-11	CONNECTOR, FPC (ZIF) 23P
CN803	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P
CN901	*1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P
CN902	*1-565-541-11	PIN, CONNECTOR (PC BOARD) 2P

TRIMMER

Ref.No	Part No.	Description
CT601	1-141-331-11	CAP, VAR, TRIMMER (CHIP)
CV501	1-141-331-11	CAP, VAR, TRIMMER (CHIP)
CV502	1-141-331-11	CAP, VAR, TRIMMER (CHIP)

When indicating parts by reference number, please include the board name.

CV-9

DIODE

Ref.No	Part No.	Description	Remark
D211	8-719-800-76	DIODE 1SS226	
D213	8-719-400-18	DIODE MA152WK	
D216	8-719-404-13	DIODE MA159-TX	
D217	8-719-404-13	DIODE MA159-TX	
D218	8-719-400-18	DIODE MA152WK	
D219	8-719-400-18	DIODE MA152WK	
D401	8-719-800-76	DIODE MA157	
D501	8-719-949-48	DIODE 1T32-2	
D601	8-719-104-34	DIODE 1S2836	
D602	8-719-400-18	DIODE MA152WK	
D604	8-719-400-18	DIODE MA152WK	
D605	8-713-949-48	DIODE 1T32-2	
D606	8-719-400-18	DIODE MA152WK	
D803	8-719-400-18	DIODE MA152WK	

FILTER

Ref.No	Part No.	Description	Remark
FL201	1-409-446-11	FILTER, TRAP	
FL202	1-236-186-11	FILTER, BAND PASS	
FL203	1-577-162-11	FILTER, CERAMIC	
FL601	1-236-266-11	FILTER, LOW PASS (YH)	
FL602	1-236-267-11	FILTER, LOW PASS (YDL)	
FL604	1-236-192-11	FILTER, LOW PASS	
FL606	1-415-669-21	DL (LC)	
FL801	1-236-209-11	FILTER, LOW PASS	

IC

Ref.No	Part No.	Description	Remark
IC201	8-752-033-40	IC CXA1201Q	
IC202	8-752-324-87	IC CXL1502M	
IC203	8-752-034-40	IC CXA1200BQ	
IC501	8-759-140-26	IC UPD6145G-601	
IC502	8-759-970-80	IC MB673198U	
IC601	8-759-032-00	IC MC68HC05N4-SC406662	
IC602	8-759-932-54	IC BU4066BF	
IC603	8-759-100-95	IC UPC324G2	
IC604	8-752-326-08	IC CXD1159Q	
IC605	8-752-034-21	IC CXA1339R	
IC606	8-752-033-34	IC CXA1072R	
IC607	8-752-032-48	IC CXA1157M	
IC608	8-759-946-00	IC MB88341PFV	
IC609	8-759-946-00	IC MB88341PFV	
IC610	8-759-937-56	IC S-8054ALB-LM-S	
IC801	8-752-326-18	IC CXD1204R	
IC802	8-759-031-85	IC MC68HC05C4-SC411530	
IC803	8-759-971-93	IC MSM6219GS	
IC804	8-759-946-00	IC MB88341PFV	
IC805	8-759-030-35	IC MPC1725M	
IC806	8-759-979-41	IC LM358PS	
IC807	8-759-981-82	IC RC3414M	
IC808	8-759-979-41	IC LM358PS	
IC810	8-759-500-11	IC MM-1036XF	

JACK

Ref.No	Part No.	Description	Remark
J201	1-537-142-11	TERMINAL BOARD (AUDIO/RFU DC/VIDEO OUT)	
J202	1-568-409-11	JACK, PIN 2P (AUDIO/VIDEO IN) (Australian, E MODEL)	

COIL

Ref.No	Part No.	Description	Remark
L201	1-412-032-11	INDUCTOR CHIP 100UH	
L202	1-412-026-11	INDUCTOR CHIP 1UH	
L203	1-412-032-11	INDUCTOR CHIP 100UH	
L204	1-412-031-11	INDUCTOR CHIP 47UH	
L205	1-412-031-11	INDUCTOR CHIP 47UH	
L208	1-412-029-11	INDUCTOR CHIP 10UH	
L209	1-412-032-11	INDUCTOR CHIP 100UH	
L210	1-410-387-11	INDUCTOR CHIP 33UH	
L211	1-410-656-11	INDUCTOR CHIP 150UH	
L212	1-410-381-11	INDUCTOR CHIP 10UH	
L213	1-410-657-21	INDUCTOR CHIP 180UH	
L214	1-408-797-11	INDUCTOR CHIP 470UH	
L215	1-408-795-21	INDUCTOR CHIP 330UH	
L216	1-408-795-21	INDUCTOR CHIP 330UH	
L217	1-410-657-21	INDUCTOR CHIP 180UH	
L219	1-412-032-11	INDUCTOR CHIP 100UH	
L220	1-410-380-31	INDUCTOR CHIP 8.2UH	
L221	1-408-795-21	INDUCTOR CHIP 330UH	
L222	1-410-655-31	INDUCTOR CHIP 120UH	
L223	1-410-393-11	INDUCTOR CHIP 100UH	
L224	1-410-656-11	INDUCTOR CHIP 150UH	
L227	1-410-389-31	INDUCTOR CHIP 47UH	
L228	1-410-388-21	INDUCTOR CHIP 39UH	
L401	1-410-390-11	INDUCTOR CHIP 56UH	
L402	1-410-387-11	INDUCTOR CHIP 33UH	
L404	1-410-383-31	INDUCTOR CHIP 15UH	
L405	1-410-388-21	INDUCTOR CHIP 39UH	
L501	1-410-390-11	INDUCTOR CHIP 56UH	
L502	1-412-032-11	INDUCTOR CHIP 100UH	
L503	1-408-797-11	INDUCTOR CHIP 470UH	
L601	1-412-031-11	INDUCTOR CHIP 47UH	
L602	1-412-029-11	INDUCTOR CHIP 10UH	
L603	1-412-029-11	INDUCTOR CHIP 10UH	
L604	1-412-026-11	INDUCTOR CHIP 1UH	
L605	1-412-026-11	INDUCTOR CHIP 1UH	
L606	1-412-026-11	INDUCTOR CHIP 1UH	
L607	1-412-032-11	INDUCTOR CHIP 100UH	
L608	1-412-029-11	INDUCTOR CHIP 10UH	
L609	1-412-032-11	INDUCTOR CHIP 100UH	
L610	1-412-029-11	INDUCTOR CHIP 10UH	
L613	1-412-031-11	INDUCTOR CHIP 47UH	
L614	1-410-657-21	INDUCTOR CHIP 180UH	
L801	1-410-655-31	INDUCTOR CHIP 120UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q202	8-729-100-66	TRANSISTOR 2SC1623	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
Q203	8-729-100-66	TRANSISTOR 2SC1623	
Q204	8-729-101-07	TRANSISTOR 2SB798-DL	
Q206	8-729-901-01	TRANSISTOR DTC144EK	
Q207	8-729-901-01	TRANSISTOR DTC144EK	
Q208	8-729-901-01	TRANSISTOR DTC144EK	
Q209	8-729-216-22	TRANSISTOR 2SA1162	
Q210	8-729-101-07	TRANSISTOR 2SB798-DL	
Q211	8-729-901-01	TRANSISTOR DTC144EK	
Q212	8-729-901-01	TRANSISTOR DTC144EK	
Q213	8-729-100-66	TRANSISTOR 2SC1623	
Q215	8-729-100-66	TRANSISTOR 2SC1623	
Q216	8-729-100-66	TRANSISTOR 2SC1623	
Q217	8-729-216-22	TRANSISTOR 2SA1162	
Q222	8-729-101-07	TRANSISTOR 2SB798-DL	
Q223	8-729-901-01	TRANSISTOR DTC144EK	
Q224	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q225	8-729-100-66	TRANSISTOR 2SC1623	
Q226	8-729-901-06	TRANSISTOR DTA144EK	
Q227	8-729-805-41	TRANSISTOR 2SC3398	
Q228	8-729-100-66	TRANSISTOR 2SC1623	
Q229	8-729-216-22	TRANSISTOR 2SA1162	
Q230	8-729-122-63	TRANSISTOR 2SA1226	
Q231	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q232	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q233	8-729-216-22	TRANSISTOR 2SA1162	
Q241	8-729-901-06	TRANSISTOR DTA144EK	
Q242	8-729-901-01	TRANSISTOR DTC144EK	
Q243	8-729-100-66	TRANSISTOR 2SC1623	
Q244	8-729-901-01	TRANSISTOR DTC144EK	
Q250	8-729-100-66	TRANSISTOR 2SC1623	
Q251	8-729-216-22	TRANSISTOR 2SA1162	
Q254	8-729-100-66	TRANSISTOR 2SC1623	
Q401	8-729-402-84	TRANSISTOR XN4601	
Q403	8-729-421-23	TRANSISTOR XN1216	
Q405	8-729-100-66	TRANSISTOR 2SC1623	
Q406	8-729-100-66	TRANSISTOR 2SC1623	
Q407	8-729-100-66	TRANSISTOR 2SC1623	
Q408	8-729-216-22	TRANSISTOR 2SA1162	
Q409	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q410	8-729-216-22	TRANSISTOR 2SA1162	
Q501	8-729-100-66	TRANSISTOR 2SC1623	
Q502	8-729-100-66	TRANSISTOR 2SC1623	
Q551	8-729-901-06	TRANSISTOR DTA144EK	
Q552	8-729-902-XX	TRANSISTOR DTC114TK	
Q553	8-729-902-XX	TRANSISTOR DTC114TK	
Q602	8-729-100-66	TRANSISTOR 2SC1623	
Q603	8-729-216-22	TRANSISTOR 2SA1162	
Q604	8-729-805-42	TRANSISTOR 2SC3859	
Q605	8-729-901-01	TRANSISTOR DTC144EK	
Q606	8-729-901-01	TRANSISTOR DTC144EK	
Q607	8-729-805-42	TRANSISTOR 2SC3859	
Q608	8-729-100-66	TRANSISTOR 2SC1623	
Q609	8-729-100-66	TRANSISTOR 2SC1623	
Q610	8-729-216-22	TRANSISTOR 2SA1162	
Q611	8-729-100-66	TRANSISTOR 2SC1623	
Q612	8-729-216-22	TRANSISTOR 2SA1162	
Q613	8-729-100-66	TRANSISTOR 2SC1623	
Q614	8-729-216-22	TRANSISTOR 2SA1162	
Q615	8-729-100-66	TRANSISTOR 2SC1623	
Q616	8-729-100-66	TRANSISTOR 2SC1623	
Q617	8-729-100-66	TRANSISTOR 2SC1623	
Q618	8-729-100-66	TRANSISTOR 2SC1623	
Q619	8-729-100-66	TRANSISTOR 2SC1623	
Q620	8-729-100-66	TRANSISTOR 2SC1623	
Q621	8-729-805-42	TRANSISTOR 2SC3859	
Q622	8-729-805-42	TRANSISTOR 2SC3859	
Q623	8-729-805-42	TRANSISTOR 2SC3859	
Q624	8-729-805-42	TRANSISTOR 2SC3859	
Q625	8-729-216-22	TRANSISTOR 2SA1162	
Q626	8-729-100-66	TRANSISTOR 2SC1623	
Q627	8-729-216-22	TRANSISTOR 2SA1162	
Q628	8-729-216-22	TRANSISTOR 2SA1162	
Q629	8-729-920-08	TRANSISTOR DTC124TK	
Q630	8-729-216-22	TRANSISTOR 2SA1162	
Q631	8-729-216-22	TRANSISTOR 2SA1162	
Q632	8-729-100-66	TRANSISTOR 2SC1623	
Q633	8-729-216-22	TRANSISTOR 2SA1162	
Q634	8-729-100-66	TRANSISTOR 2SC1623	
Q635	8-729-216-22	TRANSISTOR 2SA1162	
Q638	8-729-216-22	TRANSISTOR 2SA1162	
Q639	8-729-805-42	TRANSISTOR 2SC3859	
Q640	8-729-216-22	TRANSISTOR 2SA1162	
Q641	8-729-100-66	TRANSISTOR 2SC1623	
Q642	8-729-216-22	TRANSISTOR 2SA1162	
Q643	8-729-100-66	TRANSISTOR 2SC1623	
Q644	8-729-216-22	TRANSISTOR 2SA1162	
Q645	8-729-100-66	TRANSISTOR 2SC1623	
Q646	8-729-216-22	TRANSISTOR 2SA1162	
Q647	8-729-100-66	TRANSISTOR 2SC1623	
Q648	8-729-216-22	TRANSISTOR 2SA1162	
Q801	8-729-216-22	TRANSISTOR 2SA1162	
Q802	8-729-100-66	TRANSISTOR 2SC1623	
Q803	8-729-402-19	TRANSISTOR XN6501	
Q804	8-729-402-19	TRANSISTOR XN6501	
Q805	8-729-901-01	TRANSISTOR DTC144EK	
Q806	8-729-100-66	TRANSISTOR 2SC1623	
Q807	8-729-100-66	TRANSISTOR 2SC1623	
Q809	8-729-805-42	TRANSISTOR 2SC3859	
Q810	8-729-805-42	TRANSISTOR 2SC3859	
Q811	8-729-901-06	TRANSISTOR DTA144EK	
Q812	8-729-901-06	TRANSISTOR DTA144EK	
Q816	8-729-100-66	TRANSISTOR 2SC1623	
Q817	8-729-216-22	TRANSISTOR 2SA1162	
Q818	8-729-100-66	TRANSISTOR 2SC1623	
Q819	8-729-119-76	TRANSISTOR 2SB1175-HFE	

When indicating parts by reference number, please include the board name.

CV-9

Ref.No	Part No.	Description	Remark
Q820	8-729-100-66	TRANSISTOR 2SC1623	
Q822	8-729-216-22	TRANSISTOR 2SA1162	
Q824	8-729-901-01	TRANSISTOR DTC144EK	
Q825	8-729-901-01	TRANSISTOR DTC144EK	
Q826	8-729-216-22	TRANSISTOR 2SA1162	
Q827	8-729-100-66	TRANSISTOR 2SC1623	
Q828	8-729-216-22	TRANSISTOR 2SA1162	
Q830	8-729-805-42	TRANSISTOR 2SC3859	

RESISTOR

Ref.No	Part No.	Description				Remark
R201	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R202	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R203	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R204	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R205	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R206	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R207	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R208	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R209	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R210	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R211	1-216-304-11	METAL GLAZE	3.3	5%	1/10W	
R212	1-216-015-00	METAL GLAZE	39	5%	1/10W	(Australian, E)
R213	1-216-015-00	METAL GLAZE	39	5%	1/10W	(Australian, E)
R214	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R215	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R216	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R218	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R219	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R220	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R221	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R223	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R224	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R226	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R227	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R231	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R232	1-216-029-00	METAL GLAZE	150	5%	1/10W	
R233	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R234	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R235	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R236	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R237	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R238	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R241	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R242	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R243	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R246	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R247	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R248	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R249	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R250	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R251	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R264	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R265	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R266	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R267	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R268	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R270	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R271	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R274	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R275	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R276	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R277	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R279	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R281	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R282	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R283	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R284	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R285	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R287	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R288	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R289	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R290	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R291	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R292	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R293	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R294	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R295	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R296	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R297	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R298	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R299	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R300	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R301	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R302	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R303	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R304	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R305	1-216-027-00	METAL GLAZE	120	5%	1/10W	
R306	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R307	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R309	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R310	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R311	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R312	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R313	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R314	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R315	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R316	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R317	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R318	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R319	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R320	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R321	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R322	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R323	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R324	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R325	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R327	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R348	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R351	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R355	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R356	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R357	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R369	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R376	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R377	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R378	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R380	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R381	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R383	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R384	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R385	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R389	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R395	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R396	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R398	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R399	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R401	1-216-031-00	METAL GLAZE	180	5%	1/10W	
R402	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R403	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R404	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R405	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R406	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R407	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R408	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R409	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R410	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R411	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R413	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R414	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R415	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R416	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R417	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R418	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R419	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R420	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R421	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R422	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R424	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R425	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R426	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R427	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R428	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R429	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R430	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R431	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R432	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R433	1-216-099-00	METAL GLAZE	120K	5%	1/10W	
R451	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R452	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R501	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R502	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R503	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R504	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R505	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R506	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R507	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R508	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R509	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R510	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R511	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R512	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R513	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R514	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R515	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R516	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R517	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R518	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R519	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R520	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R521	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R522	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R523	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R524	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R525	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R551	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R552	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R553	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R554	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R603	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R604	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R605	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R606	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R607	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R608	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R609	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R610	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R611	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R612	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R613	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R614	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R615	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R616	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R617	1-216-134-00	METAL GLAZE	2.2	5%	1/8W	
R618	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R619	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R620	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R621	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R622	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R623	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R624	1-216-073-00	METAL GLAZE	10K	5%	1/10W	

When indicating parts by reference number, please include the board name.

CV-9

Ref.No	Part No.	Description				Remark
R625	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R626	1-216-068-00	METAL GLAZE	6.2K	5%	1/10W	
R627	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R628	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R629	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R630	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R631	1-216-031-00	METAL GLAZE	180	5%	1/10W	
R632	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R633	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R634	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R635	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R636	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R637	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R638	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R639	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R640	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R641	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R642	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R643	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R644	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R645	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R646	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R647	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R648	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R649	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R650	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R651	1-216-103-00	METAL GLAZE	180K	5%	1/10W	
R652	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R653	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R654	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R655	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R656	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R657	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R658	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R659	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R660	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R661	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R662	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R663	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R664	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R667	1-216-131-11	METAL GLAZE	2.7M	5%	1/10W	
R668	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R669	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R670	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R671	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R672	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R673	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R674	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R675	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R676	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R677	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R678	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R679	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R680	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R681	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R682	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R683	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R685	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R686	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R687	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R688	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R690	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R696	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R697	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R698	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R699	1-216-099-00	METAL GLAZE	120K	5%	1/10W	
R700	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R701	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R702	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R703	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R704	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R705	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R706	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R707	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R708	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R709	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R710	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R711	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R712	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R713	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R714	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R715	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R716	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R717	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R718	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R719	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R720	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R721	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R722	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R723	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R724	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R725	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R726	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R727	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R728	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R729	1-216-039-00	METAL GLAZE	390	5%	1/10W	
R730	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R731	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R732	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R733	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R734	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R735	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R736	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R737	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R738	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R739	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R740	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R741	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R742	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R744	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R745	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R746	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R747	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R749	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R750	1-216-103-00	METAL GLAZE	180K	5%	1/10W	
R751	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R752	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R753	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R754	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R755	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R757	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R758	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R759	1-216-072-00	METAL GLAZE	9.1K	5%	1/10W	
R760	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R761	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R762	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R763	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R764	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R765	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R766	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R767	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R768	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R769	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R770	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R771	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R772	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R773	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R774	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R776	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R777	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R780	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R781	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R782	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R783	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R785	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R786	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R793	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R794	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R801	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R802	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R803	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R804	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R805	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R806	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R807	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R808	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R809	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R810	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R811	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R812	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R813	1-216-134-00	METAL GLAZE	2.2	5%	1/8W	
R814	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R815	1-216-023-00	METAL GLAZE	82	5%	1/10W	
R816	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R817	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R818	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R819	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R820	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R821	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R822	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R823	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R824	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R825	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R826	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R827	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R828	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R829	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R831	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R832	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R833	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R836	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R837	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R838	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R839	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R840	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R841	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R843	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R844	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R845	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R846	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R847	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R848	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R849	1-216-144-00	METAL GLAZE	5.6	5%	1/8W	
R850	1-216-134-00	METAL GLAZE	2.2	5%	1/8W	
R857	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R858	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R859	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R860	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R861	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R862	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R863	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R864	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R865	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R866	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R867	1-216-105-00	METAL GLAZE	220K	5%	1/10W	
R868	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R869	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R870	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R871	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R872	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R873	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R874	1-216-093-00	METAL GLAZE	68K	5%	1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R875	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R876	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R877	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R878	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R879	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R880	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R881	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R882	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R883	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R884	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R885	1-216-099-00	METAL GLAZE 120K 5% 1/10W	
R886	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R887	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R888	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R889	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R890	1-216-144-00	METAL GLAZE 5.6 5% 1/8W	
R891	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R892	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R893	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R894	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R895	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R896	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R897	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R898	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R899	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV201	1-230-874-11	RES, ADJ, METAL GLAZE 100K	
RV202	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV203	1-230-874-11	RES, ADJ, METAL GLAZE 100K	
RV204	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV205	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV207	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV208	1-230-866-11	RES, ADJ, METAL GLAZE 470	
RV401	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV402	1-230-867-11	RES, ADJ, METAL GLAZE 1K	
RV403	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV552	1-230-874-11	RES, ADJ, METAL GLAZE 100K	
RV801	1-230-875-21	RES, ADJ, METAL GLAZE 220K	

CRYSTAL

Ref.No	Part No.	Description	Remark
X201	1-577-117-21	VIBRATOR, CRYSTAL (4.43MHz)	
X601	1-577-118-11	VIBRATOR, LITHIUM NIOBATE (4MHz)	
X602	1-567-733-11	VIBRATOR, CRYSTAL (17MHz)	
X603	1-577-119-11	OSCILLATOR, CRYSTAL (28MHz)	

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Ref.No	Part No.	Description	Remark
	*A-7051-959-A	PJ-20 BOARD, COMPLETE (Ref.No 4,000 Series)	

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CAPACITOR

Ref.No	Part No.	Description	Remark
C101	1-164-232-11	CERAMIC CHIP 0.01MF 50V	
C102	1-124-778-00	ELECT CHIP 22MF 20% 6.3V	
C103	1-163-118-00	CERAMIC CHIP 110PF 5% 50V	
C104	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C105	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C106	1-126-603-11	ELECT CHIP 4.7MF 20% 35V	
C107	1-126-603-11	ELECT CHIP 4.7MF 20% 35V	
C108	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C109	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C110	1-164-232-11	CERAMIC CHIP 0.01MF 50V	
C111	1-126-193-11	ELECT CHIP 1MF 20% 50V	
C112	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C113	1-163-131-00	CERAMIC CHIP 390PF 5% 50V	
C114	1-163-093-00	CERAMIC CHIP 10PF 5% 50V	
C115	1-163-086-00	CERAMIC CHIP 3PF 0.25PF 50V	
C116	1-164-232-11	CERAMIC CHIP 0.01MF 50V	
C117	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C118	1-163-033-00	CERAMIC CHIP 0.022MF 50V	
C119	1-163-033-00	CERAMIC CHIP 0.022MF 50V	
C120	1-164-232-11	CERAMIC CHIP 0.01MF 50V	
C121	1-163-131-00	CERAMIC CHIP 390PF 5% 50V	
C122	1-163-033-00	CERAMIC CHIP 0.022MF 50V	
C123	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C124	1-164-182-11	CERAMIC CHIP 0.0033MF 10% 50V	
C125	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C126	1-164-232-11	CERAMIC CHIP 0.01MF 50V	
C127	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C128	1-124-779-00	ELECT CHIP 10MF 20% 16V	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN202	*1-565-882-11	PIN, CONNECTOR (PC BOARD) 10P	

DIODE

Ref.No	Part No.	Description	Remark
D101	8-719-400-18	DIODE MA152WK	
D102	8-719-800-76	DIODE 1SS226	
D103	8-719-400-18	DIODE MA152WK	
D104	8-719-400-18	DIODE MA152WK	

DELAY LINE

Ref.No	Part No.	Description	Remark
DL101	1-415-593-11	DELAY LINE, ULTRASONIC GLASS	

FILTER

Ref.No	Part No.	Description	Remark
FL101	1-236-188-11	FILTER, BAND PASS	

IC

Ref.No	Part No.	Description	Remark
IC101	8-759-605-61	IC CXA1203N	

When indicating parts by reference number, please include the board name.

COIL

Ref.No	Part No.	Description	Remark
L101	1-412-031-11	INDUCTOR CHIP 47UH	
L102	1-412-032-11	INDUCTOR CHIP 100UH	
L103	1-410-383-31	INDUCTOR CHIP 15UH	
L104	1-410-385-11	INDUCTOR CHIP 22UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q101	8-729-901-01	TRANSISTOR DTC144EK	
Q102	8-729-901-06	TRANSISTOR DTA144EK	
Q103	8-729-100-66	TRANSISTOR 2SC1623	
Q104	8-729-100-66	TRANSISTOR 2SC1623	
Q105	8-729-100-66	TRANSISTOR 2SC1623	
Q106	8-729-100-66	TRANSISTOR 2SC1623	
Q107	8-729-100-66	TRANSISTOR 2SC1623	
Q108	8-729-100-66	TRANSISTOR 2SC1623	
Q109	8-729-100-66	TRANSISTOR 2SC1623	
Q110	8-729-100-66	TRANSISTOR 2SC1623	
Q111	8-729-901-06	TRANSISTOR DTA144EK	
Q112	8-729-900-99	TRANSISTOR DTA144WK	
Q113	8-729-901-01	TRANSISTOR DTC144EK	

RESISTOR

Ref.No	Part No.	Description	Remark
R101	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R102	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R103	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R104	1-216-699-11	METAL CHIP 100K 0.50% 1/10W	
R105	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R106	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R107	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R108	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R109	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R110	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R111	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R112	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R113	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R114	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R116	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R117	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R118	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R119	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R120	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R121	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R122	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R123	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R124	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R125	1-216-023-00	METAL GLAZE 82 5% 1/10W	
R126	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R127	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R128	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R129	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R130	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R131	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R132	1-216-027-00	METAL GLAZE 120 5% 1/10W	
R133	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R134	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R145	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R146	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R147	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R148	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R149	1-216-079-00	METAL GLAZE 18K 5% 1/10W	
R150	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R151	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R152	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R153	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R154	1-216-089-00	METAL GLAZE 47K 5% 1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV102	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV103	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV104	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	

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*A-7061-958-A MA-37P BOARD, COMPLETE (Ref.No 9,000 Series)
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CAPACITOR

Ref.No	Part No.	Description	Remark
C451	1-126-154-11	ELECT 47MF 20% 6.3V	
C452	1-162-638-11	CERAMIC CHIP 1MF 16V	
C453	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C455	1-163-137-00	CERAMIC CHIP 680PF 5% 50V	
C456	1-163-077-00	CERAMIC CHIP 0.1MF 50V	
C457	1-164-157-11	CERAMIC CHIP 0.068MF 10% 25V	
C459	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C460	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C464	1-162-638-11	CERAMIC CHIP 1MF 16V	
C465	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C466	1-124-225-00	ELECT 100MF 20% 6.3V	
C470	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C471	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C474	1-162-638-11	CERAMIC CHIP 1MF 16V	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN451	1-565-877-11	PIN, CONNECTOR (PC BOARD) 5P	
CN452	*1-566-182-11	PIN, CONNECTOR (PC BOARD) 3P	

IC

Ref.No	Part No.	Description	Remark
IC451	8-759-820-51	IC LA7293	

JACK

Ref.No	Part No.	Description	Remark
J451	1-507-921-00	JACK (MIC)	
J452	1-563-454-11	JACK, MINIATURE (DC OUT)	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q451	8-729-100-66	TRANSISTOR 2SC1623	

When indicating parts by reference number, please include the board name.

MA-37P PS-225P

RESISTOR

Ref.No	Part No.	Description	Remark
R451	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R452	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R453	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R455	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R456	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	
R459	1-216-001-00	METAL GLAZE 10 5% 1/10W	
R460	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R462	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R465	1-216-079-00	METAL GLAZE 18K 5% 1/10W	
R467	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	

SWITCH

Ref.No	Part No.	Description	Remark
S451	1-570-910-21	SWITCH, TACTIL (REFLOW TYPE) (REC/START/STOP)	

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*A-7061-955-A PS-225P BOARD, COMPLETE (Ref.No 1,000 Series)

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CAPACITOR

Ref.No	Part No.	Description	Remark
C936	1-124-438-00	ELECT 1MF 20% 50V	
C937	1-124-438-00	ELECT 1MF 20% 50V	
C938	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C939	1-124-438-00	ELECT 1MF 20% 50V	
C940	1-164-161-11	CERAMIC CHIP 0.0022MF 50V	
C941	1-127-489-81	ELECT(SOLID) 10MF 20% 10V	
C942	1-163-125-00	CERAMIC CHIP 220PF 10% 50V	
C943	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C944	1-127-561-11	ELECT(SOLID) 33MF 20% 10V	
C945	1-162-637-11	CERAMIC CHIP 0.47MF 16V	
C955	1-127-489-81	ELECT(SOLID) 10MF 20% 10V	
C957	1-124-589-11	ELECT 47MF 20% 10V	
C958	1-124-589-11	ELECT 47MF 20% 10V	
C959	1-124-589-11	ELECT 47MF 20% 10V	
C961	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	
C962	1-163-033-00	CERAMIC CHIP 0.022MF 50V	
C963	1-163-125-00	CERAMIC CHIP 220PF 10% 50V	
C964	1-124-234-00	ELECT 22MF 20% 16V	
C965	1-124-261-00	ELECT 10MF 20% 50V	
C966	1-124-261-00	ELECT 10MF 20% 50V	
C967	1-127-509-00	ELECT(SOLID) 3.3MF 20% 25V	
C968	1-124-598-11	ELECT 22MF 20% 25V	
C978	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C984	1-124-570-11	ELECT 220MF 20% 16V	
C985	1-163-019-00	CERAMIC CHIP 0.0068MF 10% 50V	
C988	1-164-161-11	CERAMIC CHIP 0.0022MF 50V	
C989	1-164-161-11	CERAMIC CHIP 0.0022MF 50V	
C990	1-164-161-11	CERAMIC CHIP 0.0022MF 50V	
C991	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN901	1-506-481-11	PIN, CONNECTOR 2P	

DIODE

Ref.No	Part No.	Description	Remark
D935 ⚠	8-719-106-71	DIODE RD12M-B2	
D936	8-719-800-76	DIODE 1SS226	
D937	8-719-800-76	DIODE 1SS226	
D938	8-719-510-11	DIODE D1FS4	
D939	8-719-801-48	DIODE 1SS193	
D940	8-719-801-48	DIODE 1SS193	
D941	8-719-802-36	DIODE 1SS250	
D942	8-719-801-48	DIODE 1SS193	
D943	8-719-801-48	DIODE 1SS193	

IC LINK

Ref.No	Part No.	Description	Remark
PS901 ⚠	1-532-841-21	LINK, IC PRF1600 (1.6A)	
PS902 ⚠	1-532-841-21	LINK, IC PRF1600 (1.6A)	
PS903 ⚠	1-532-841-21	LINK, IC PRF1600 (1.6A)	

IC

Ref.No	Part No.	Description	Remark
IC935	8-759-937-36	IC TL1451ACNS	

JACK

Ref.No	Part No.	Description	Remark
J901	1-537-241-11	TERMINAL BOARD (BATTERY)	

COIL

Ref.No	Part No.	Description	Remark
L935	1-410-690-11	COIL, CHOKE 22UH	
L937	1-421-918-11	COIL, CHOKE 10UH	
L938	1-410-626-11	COIL, CHOKE 47UH	
L939	1-410-626-11	COIL, CHOKE 47UH	
L940	1-408-978-21	INDUCTOR 47UH	
L942	1-410-626-11	COIL, CHOKE 47UH	
L944	1-410-385-11	INDUCTOR CHIP 22UH	
L946	1-421-918-11	COIL, CHOKE 10UH	
L951	1-410-658-31	INDUCTOR CHIP 220UH	
L952	1-412-026-11	INDUCTOR CHIP 1UH	
L953	1-412-026-11	INDUCTOR CHIP 1UH	
L954	1-412-026-11	INDUCTOR CHIP 1UH	
L955	1-412-026-11	INDUCTOR CHIP 1UH	
L956	1-412-026-11	INDUCTOR CHIP 1UH	
L957	1-412-026-11	INDUCTOR CHIP 1UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q935	8-729-805-43	TRANSISTOR 2SC3396	
Q936	8-729-805-67	TRANSISTOR 2SA1342	
Q937	8-729-805-67	TRANSISTOR 2SA1342	
Q938	8-729-805-43	TRANSISTOR 2SC3396	
Q939	8-729-805-67	TRANSISTOR 2SA1342	
Q940	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q941 ⚠	8-729-105-29	TRANSISTOR 2SA1385	
Q942	8-729-805-25	TRANSISTOR 2SB1121	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
Q943	8-729-805-67	TRANSISTOR 2SA1342	
Q944	8-729-805-43	TRANSISTOR 2SC3396	
Q945	8-729-216-22	TRANSISTOR 2SA1162	
Q946	8-729-216-22	TRANSISTOR 2SA1162	
Q947	⚠.8-729-140-55	TRANSISTOR 2SK739	
Q952	8-729-901-04	TRANSISTOR DTA114EK	
Q953	8-729-901-01	TRANSISTOR DTC144EK	

RESISTOR

Ref.No	Part No.	Description	Remark
R935	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R936	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R937	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R938	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R939	1-216-099-00	METAL GLAZE 120K 5% 1/10W	
R940	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R941	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R942	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R943	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R944	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R945	1-216-027-00	METAL GLAZE 120 5% 1/10W	
R946	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R947	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R948	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R949	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R950	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R951	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R953	1-216-099-00	METAL GLAZE 120K 5% 1/10W	
R954	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R955	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R956	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R957	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R958	1-216-035-00	METAL GLAZE 270 5% 1/10W	
R959	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R960	1-216-001-00	METAL GLAZE 10 5% 1/10W	
R961	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R962	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R975	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R978	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R985	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R986	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R987	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R990	1-216-121-00	METAL GLAZE 1M 5% 1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV936	1-230-867-11	RES, ADJ, METAL GLAZE 1K	
RV937	1-230-866-11	RES, ADJ, METAL GLAZE 470	
RV938	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	

TRANSFORMER

Ref.No	Part No.	Description	Remark
T936	1-449-454-11	TRANSFORMER, CONVERTER	

CONNECTOR

Ref.No	Part No.	Description	Remark
W901	1-564-610-11	CONNECTOR, BOARD TO BOARD	
W902	1-564-610-11	CONNECTOR, BOARD TO BOARD	

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*1-631-827-21 KS-6P BOARD (Ref.No 8,000 Series)
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CONNECOTR

Ref.No	Part No.	Description	Remark
CN501	*1-562-880-21	CONNECOTR, CARD EDGE 15P	

CONNECTOR

Ref.No	Part No.	Description	Remark
W502	1-574-456-11	CABLE, FLAT (1.0MM PITCH) 15P	

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*1-631-831-21 RC-29P BOARD (Ref.No 10,000 Series)
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CONNECTOR

Ref.No	Part No.	Description	Remark
CN401	1-566-760-11	PIN, CONNECTOR (PC BOARD) 5P	
CN951	*1-568-521-11	PIN, CONNECTOR (PC BOARD) 13P	
CN952	*1-566-182-11	PIN, CONNECTOR (PC BOARD) 3P	

JACK

Ref.No	Part No.	Description	Remark
J951	1-565-276-11	JACK, ULTRA SMALL 1P (REMOTE)	
J952	1-507-921-00	JACK (②)	

COIL

Ref.No	Part No.	Description	Remark
L991	1-410-369-11	INDUCTOR CHIP 1UH	
L992	1-410-369-11	INDUCTOR CHIP 1UH	
L993	1-410-369-11	INDUCTOR CHIP 1UH	
L994	1-410-369-11	INDUCTOR CHIP 1UH	

RESISTOR

Ref.No	Part No.	Description	Remark
R995	1-216-296-00	METAL GLAZE 0 5% 1/8W	

SWITCH

Ref.No	Part No.	Description	Remark
S951	1-553-977-00	SWITCH, SLIDE (STANDBY/LOCK)	
S952	1-571-838-11	SWITCH, TACTIL (START/STOP)	

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*A-7062-012-A VF-22P BOARD, COMPLETE (Ref.No 4,000 Series)
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*3-674-372-00 HOLDER (A), LED

CAPACITOR

Ref.No	Part No.	Description	Remark
C901	1-126-369-11	ELECT 220MF 20% 6.3V	
C902	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C904	1-127-486-11	ELECT(SOLID) 47MF 20% 6.3V	
C905	⚠.1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C906	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C907	⚠.1-162-625-11	CERAMIC CHIP	0.0047MF	5%	50V
C908	⚠.1-164-182-11	CERAMIC CHIP	0.0033MF	10%	50V
C909	1-126-193-11	ELECT CHIP	1MF	20%	50V
C911	1-131-394-21	TANTALUM	68MF	10%	3.15V
C912	1-102-038-00	CERAMIC	0.001MF		500V
C913	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C915	1-126-193-11	ELECT CHIP	1MF	20%	50V
C916	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C917	1-135-166-21	TANTAL. CHIP	47MF	20%	6.3V
C918	1-162-638-11	CERAMIC CHIP	1MF		16V
C919	1-135-070-00	TANTAL. CHIP	0.1MF	10%	35V
C920	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V

CONNECTOR

Ref.No	Part No.	Description
CN901	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P
CN902	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
CN904	*1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P

CONPOSITION CIRCUIT BLOCK

Ref.No	Part No.	Description
CP901	1-238-119-11	RES, ADJ

CRT SOCKET

Ref.No	Part No.	Description
CRT901	1-526-978-21	SOCKET ASSY, CRT

DIODE

Ref.No	Part No.	Description
D903	8-719-400-20	DIODE MA152WA

IC

Ref.No	Part No.	Description
IC901	8-759-420-01	IC AN2512S

COIL

Ref.No	Part No.	Description	
L901	1-408-421-00	INDUCTOR	100UH
L902	1-410-385-11	INDUCTOR CHIP	22UH
L903	⚠.1-459-858-11	COIL, FERRITE (HLC)	

TRANSISTOR

Ref.No	Part No.	Description
Q903	⚠.8-729-106-68	TRANSISTOR 2SD1615A-GP
Q904	8-729-216-31	TRANSISTOR 2SA1163G

RESISTOR

Ref.No	Part No.	Description			Remark
R902	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W
R903	1-216-041-00	METAL GLAZE	470	5%	1/10W
R907	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W
R908	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W
R909	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R911	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R912	1-216-295-00	METAL GLAZE	0	5%	1/10W
R913	1-216-295-00	METAL GLAZE	0	5%	1/10W
R914	1-216-133-00	METAL GLAZE	3.3M	5%	1/10W
R915	1-216-133-00	METAL GLAZE	3.3M	5%	1/10W
R916	1-216-125-00	METAL GLAZE	1.5M	5%	1/10W
R917	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R919	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R920	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R921	1-216-013-00	METAL GLAZE	33	5%	1/10W
R922	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W
R923	1-216-025-00	METAL GLAZE	100	5%	1/10W
R924	1-216-306-11	METAL GLAZE	3.9	5%	1/10W
R925	1-216-336-11	METAL GLAZE	47K	1%	1/10W
R926	1-216-107-00	METAL GLAZE	270K	1%	1/10W
R928	1-216-870-11	METAL GLAZE	180K	1%	1/10W
R929	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R930	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R931	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R950	1-216-311-00	METAL GLAZE	6.8	5%	1/10W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV901	1-238-647-11	RES, ADJ, METAL GLAZE 4.7M

TRANSFORMER

Ref.No	Part No.	Description
T901	⚠.1-439-428-11	TRANSFORMER ASSY, FLYBACK

THERMISTOR

Ref.No	Part No.	Description
TH901	1-807-938-11	THERMISTOR

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*1-630-067-21 LD-17P BOARD (Ref.No 5,000 Series)

DIODE

Ref.No	Part No.	Description
D901	8-719-941-34	DIODE GL1HD51
D902	8-719-812-41	DIODE TLR124

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MISCELLANEOUS

Ref.No	Part No.	Description
	⚠.1-451-310-21	DEFLECTION YOKE (B/W) (VF-22P BOARD)
	1-542-125-21	MICROPHONE (C-2027)
	1-575-064-11	CABLE, FLAT (1.0MM PITCH) 18P (CK-19P BOARD W651)
	1-808-505-12	SENSOR (DEW)
IC601	A-7091-132-A	IC ICX027BK-2 ASSY (CCD IMAGER)
J201	1-537-142-11	TERMINAL BOARD (AUDIO/RFUDC/VIDEO OUT)
J202	1-568-409-11	JACK, PIN 2P (AUDIO/VIDEO IN) (Australian, E MODEL)
M901	A-7048-235-A	DRUM ASSY (DGU-42A-R)
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)
M903	A-7040-160-A	MOTOR ASSY, THREADING
M904	3-707-803-01	MOTOR ASSY, AF GEAR (FOCUS)
M905	3-707-802-01	MOTOR ASSY, PZ GEAR (ZOOM)
M906	3-707-810-01	METER, IRIS (IRIS)
S901	1-571-837-11	SWITCH, PUSH (ZOOM)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
S902	3-707-805-01	SWITCH ASSY, AF	
S903	1-571-099-11	SWITCH (CASSETTE DOWN)	
V901	⚠.1-452-482-11	CRT ASSY (M01JYZ60WB) (VF-14P BOARD)	
V901	⚠.1-546-085-11	CATHODE-RAY TUBE, B/W (M01KGG007WB) (VF-22P BOARD)	

****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
*3-340-514-01	BAG, PROTECTION	
*3-732-952-01	CUSHION (UPPER) (AEP(TYPE 1), E, Australian)	
*3-732-953-01	CUSHION (LOWER) (AEP(TYPE 1), E, Australian)	
*3-733-985-02	CUSHION (UPPER) (AEP(TYPE 2), UK MODEL)	
*3-733-986-02	CUSHION (LOWER) (AEP(TYPE 2), UK MODEL)	
3-750-731-41	MANUAL, INSTRUCTION (AEP, UK MODEL) (English)	
3-750-731-51	MANUAL, INSTRUCTION (AEP MODEL) (French, German, Spanish)	
3-750-731-61	MANUAL, INSTRUCTION (AEP MODEL) (Dutch, Swedish, Italian)	
3-751-270-71	MANUAL, INSTRUCTION(E, Australian MODEL) (English)	
3-751-270-81	MANUAL, INSTRUCTION (E MODEL) (French, German, Spanish)	
3-751-270-91	MANUAL, INSTRUCTION (E MODEL) (Arabic)	
*3-764-631-12	INSTRUCTION, DEW CONDENSATION (AEP, E, Australian)	

**** ACCESSORIES AND PACKING MATERIALS (KIT) ****

A-6767-706-A	RFU ADAPTOR (RFU-89EA) (AEP, E MODEL)
A-6767-707-A	RFU ADAPTOR (RFU-89EA) (UK MODEL)
A-6767-772-A	RFU ADAPTOR (RFU-89ASA) (Australian)
1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE)
3-712-673-01	SCREWDRIVER (AEP, UK, E MODEL)
*3-733-938-01	CUSHION,ACC (AEP (TYPE 1), E, Australian)
3-733-958-01	BELT, CARRYING (AEP, UK MODEL)
*3-733-771-21	INDIVIDUAL CARTON (AEP(TYPE 1), E, Australian)
*3-733-975-21	INDIVIDUAL CARTON(AEP(TYPE 2), UK MODEL)
*3-733-987-02	CUSHION, ACC (AEP(TYPE 2), UK MODEL)
3-741-534-11	BELT, SHOULDER (E, Australian MODEL)

**	AC-V30	AC POWER ADAPTOR
***	NP-66H	RECHARGEBLE BATTERY

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

****

Ref.No	Part No.	Description	Remark

HARDWARE LIST
****

SCREW

7-621-281-15	SCREW +P 2X2
7-627-553-37	PRECISION SCREW +P 2X3 TYPE 3
7-627-553-48	PRECISION SCREW +P 2X4 TYPE 3

STEEL BALL

7-671-155-01	STEEL BALL 3.0
7-671-156-01	BALL, STAINLESS

****

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SECTION 7
CAMERA ADJUSTMENTS

During the adjustment, see the adjustment element location to the adjustment from page 246.

7-1. PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

7-1-1. List of Servicing Jigs

- Oscilloscope
- Regulated power supply (2 units)
- Adjusting screwdriver
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Part Name	Part No.	Use
J-1	Filter (C14) for color temperature correction	J-6080-054-A	Auto white balance adjustment
J-2	ND filter 1.0	J-6080-808-A	Max. gain adjustment (two used)
	ND filter 0.4	J-6080-806-A	Iris adjustment, iris in/out adjustment (two used)
	ND filter 0.3	J-6080-818-A	Max. gain adjustment (two used)
	ND filter 0.1	J-6080-807-A	Iris adjustment, iris in/out adjustment
J-3	Pattern box PTB-500 *	J-6029-140-A	
J-4	Pattern box color chart	J-6020-250-A	
J-5	Siemens star	J-6080-875-A	For flange back adjustment, auto-focus adjustment
J-6	AF microcomputer data reading jig	J-6082-025-A	
J-7	Adjustment remote controller	J-6082-053-A	
J-8	Extension cable	J-6082-019-A	Extension between W602 on CD-17P board and CN601 on CV-9 board.

* PTB-100 is not available.

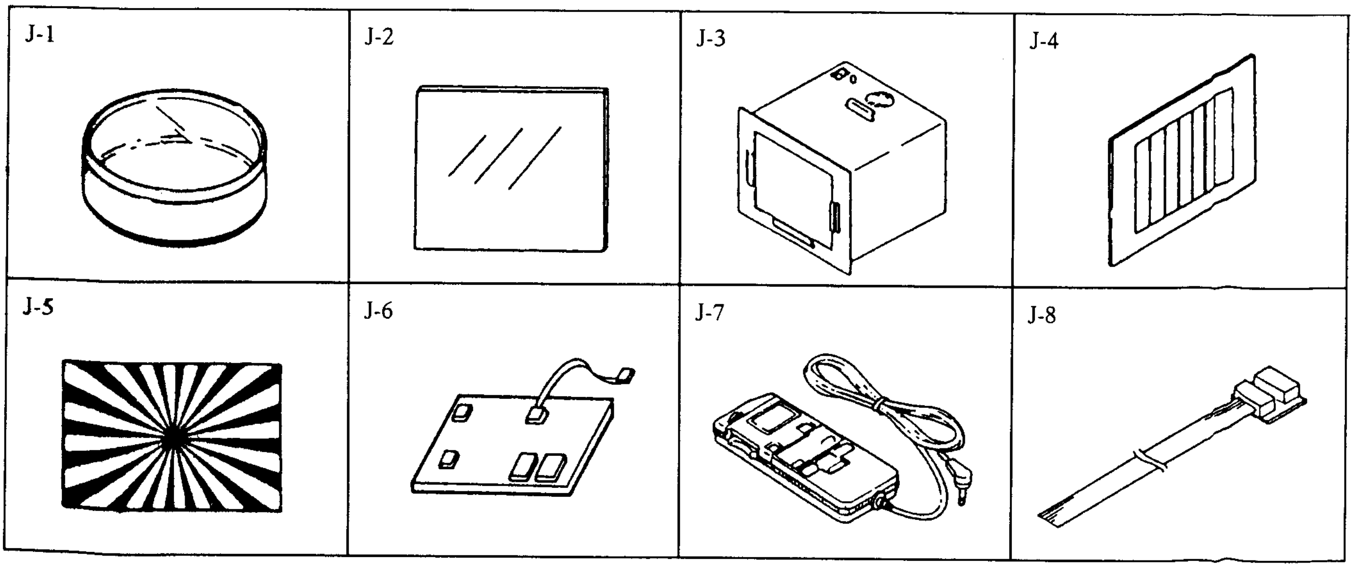


Fig. 7-1.

7-1-2. Preparations

Note: Refer to "SECTION 2 DISASSEMBLY" for details on removal of the cabinet and various boards.

1) Connect the various devices for adjustment as shown in Fig. 7-3.
2) The EVF (electronic viewfinder) is needed for confirmation of the white balance mode and shutter speed. This can confirmed on the monitor screen by turning on the data screen (ON/OFF by S509 on VK-3P board). Remove CN901 on the CV-9 board when the EVF is not needed.
3) The mic amplifier (MA-37P board) is not needed. Remove CN401 on the CO-2P board.

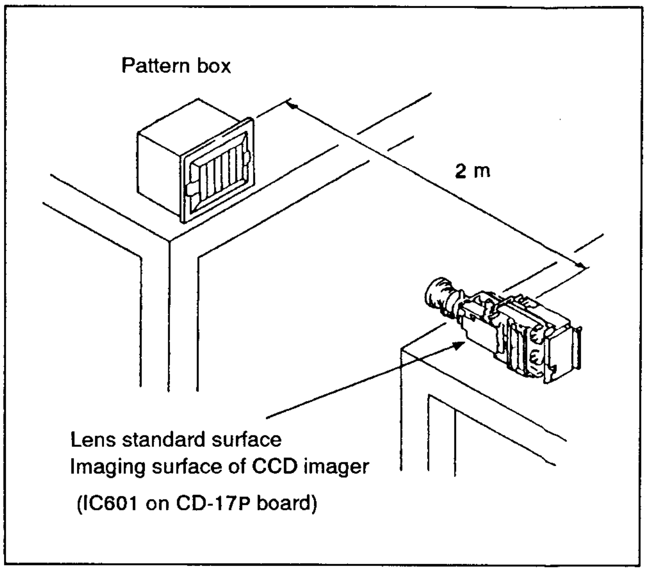
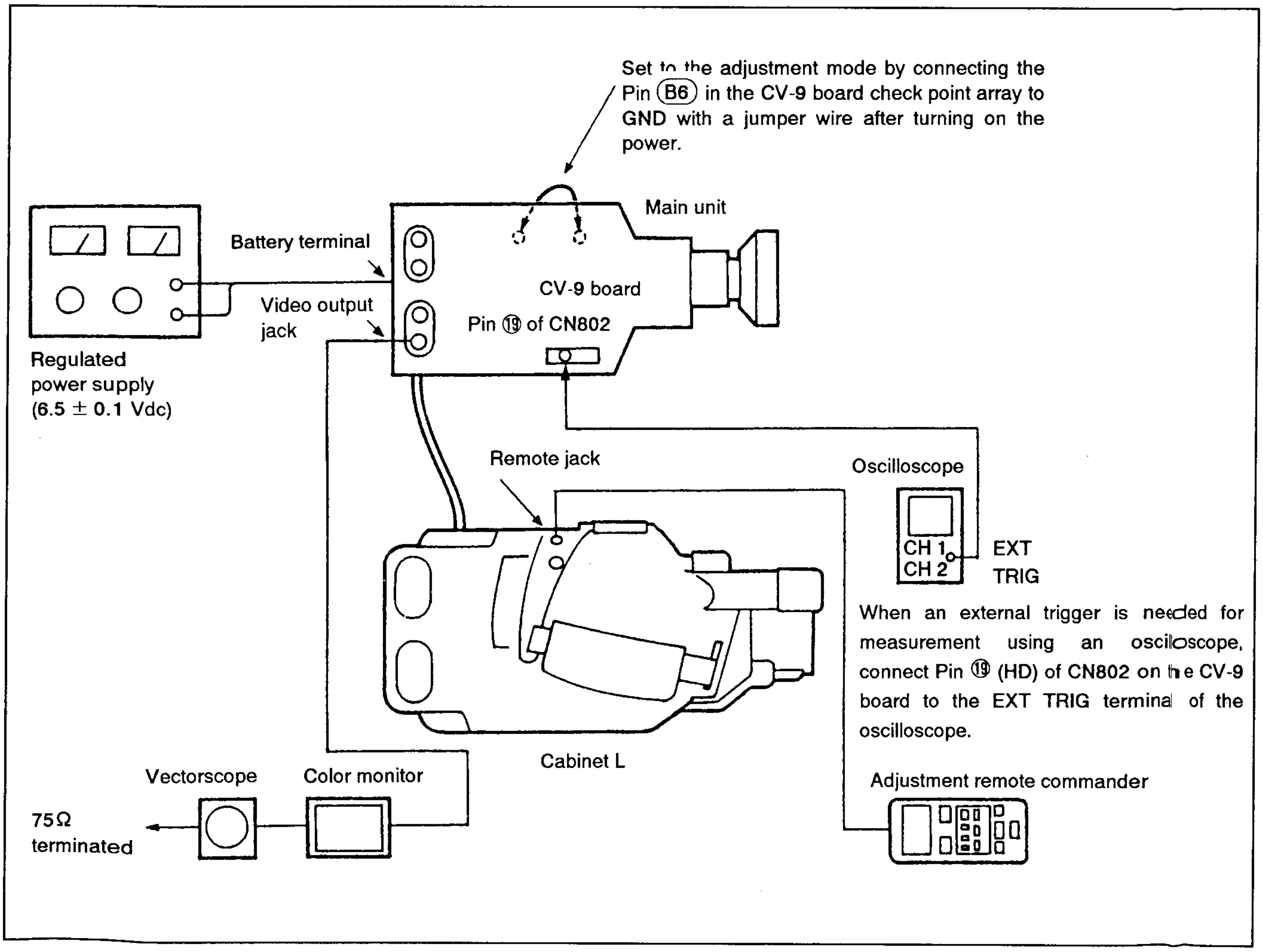

Pattern box
2 m
Lens standard surface
Imaging surface of CCD imager
(IC601 on CD-17P board)

Fig. 7-2.


Set to the adjustment mode by connecting the Pin (B6) in the CV-9 board check point array to GND with a jumper wire after turning on the power.

Main unit
Battery terminal
Video output jack
CV-9 board
Pin ⑲ of CN802
Regulated power supply (6.5 ± 0.1 Vdc)
Remote jack
Oscilloscope
CH 1
CH 2
EXT TRIG
Cabinet L
Vectorscope
Color monitor
75Ω terminated
Adjustment remote commander

When an external trigger is needed for measurement using an oscilloscope, connect Pin ⑲ (HD) of CN802 on the CV-9 board to the EXT TRIG terminal of the oscilloscope.

Fig. 7-3.

7-1-3. Precautions

1) Setting of Switches

Unless indicated otherwise, the switches are set to the following positions and adjustment is made without a cassette inserted.

1. Camera/video power switch (S501 on VK-3P board)
   ......camera
2. Standby switch (S951 on RC-29P board) ......ON
3. Auto-lock switch (Auto lock cover)
   ......OFF (When cabinet (right) is removed, the nuit goes into OFF states automatically)
4. White balance button (S654 on CK-19P board)
   ......☼ (indoors white balance mode)
5. Shutter button (S652 on CK-19P board)
   ......normal (1/50)

2) Adjustment Order

As a rule, the adjustments are performed in the listed order.

3) Subjects

1. Color bar chart (standard picture frame)
   When performing adjustment using the color bar chart, adjusting the picture frame shown in Fig. 7-4. (standard picture frame).
2. White pattern (standard picture frame)
   Remove the color bar chart from the pattern box and use the zoom lever so that the white pattern has the same size and is the same position as the color bar chart (standard picture frame).

Color bar chart standard picture frame

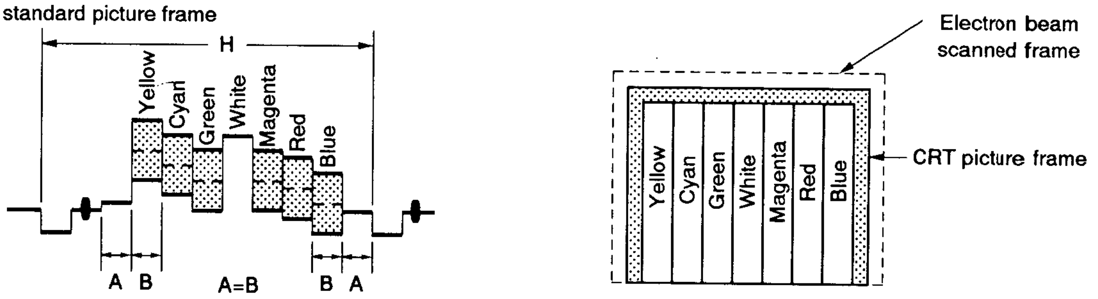


Fig. a (Video output terminal output waveform)

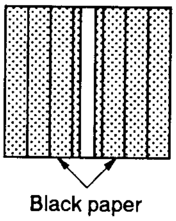
Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3. All white pattern
   Remove the color bar chart from the pattern box and set the zoom lever fully to the TELE (68 mm) side.
4. High luminance pattern
   Create the high luminance pattern as shown in Fig. 7-5., and adjust for the picture frame shown in Fig. 7-6.
5. Siemens star (J-6080-875-A)
   Adjust the direction of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.

High luminance pattern



Attach black paper over all sections of the pattern except for half the width of the white bar. Record this with the standard picture frame.

Fig. 7-5.

High luminance pattern

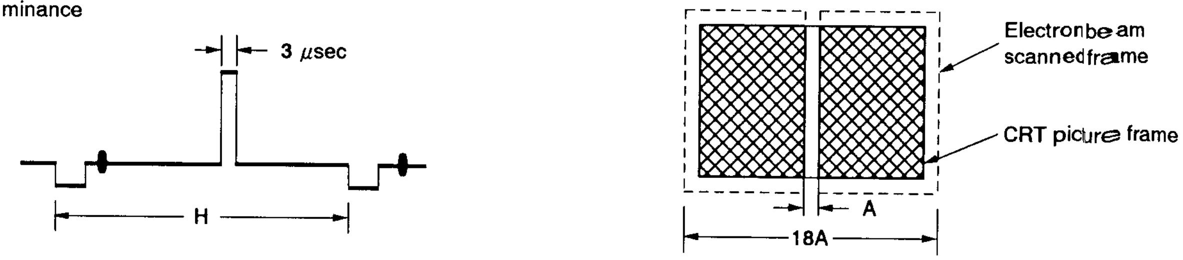


Fig. a (Video output terminal output waveform)

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-6.

7-1-4. Adjustment Remote Controller

An EVR (electronic variable resistor) is used as the adjustment element for the camera block, replacing the conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microcomputer (IC601 on CV-9 board). This microcomputer reads the data written in the nonvolatile memory of the microcomputer and sends it to the EVR. The EVR D-A converts this data (8 bits for each adjustment point) and creates the adjustment voltage.

Thus, it is necessary to change the adjustment data contained in the nonvolatile memory when adjusting the camera block, and the adjustment memory is used for this purpose.

The adjustment remote controller performs bidirectional communications with the camera block microcomputer using the remote control signal lines (LINCS). Adjustment addresses and adjustment data increment/decrement commands are sent to the camera block microcomputer from the adjustment remote controller. Adjustment addresses and adjustment data are sent from the camera block microcomputer to the adjustment remote controller.

1. Use of adjustment remote controller

Solder the lead wire to Pin (B6) (refer to 7-1-5) of the check point array on the CV-9 board.

1) Connect the adjustment remote controller to the remote terminal (J951 on RC-29P board). (Set the HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).)
2) Turn on the power of the main unit.
3) Connect Pin (B6) ($\overline{\text{CAM ADJ}}$) of the check point array to GND using a jumper wire.

   (This connection causes the EVR/AWB microcomputer to cease normal remote control operation and to begin adjustment dedicated communications.)

   Note: Be sure to make this connection only after turning on the power. The following will be displayed on the LCD of the adjustment remote controller if the connection is normal. (Adjustment data varies according to the unit.)

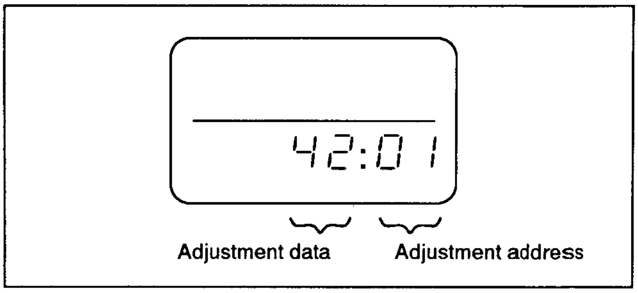


Fig. 7-7.

4) Designate the desired adjustment address using the adjustment remote controller. The adjustment address is incremented by pressing the FF (▸▸) button and decremented by pressing the REW (◂◂) button. (The adjustment address is indicated in decimal, and there are 89 addresses from 01 to 89. The adjustment address corresponds to the EVR (CV-9 board, IC608, IC609, IC804) output terminals. Refer to Table 7-3. for the adjustment contents of the various addresses.)

5) Perform adjustment by incrementing or decrementing the adjustment data.
The adjustment data is incremented by pressing the PLAY (►) button. The adjustment data is decremented by pressing the STOP (■) button.
- The adjustment data is indicated in hexadecimal. There are 256 values from 00 to FF.

Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Indication on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal equivalent	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

- The adjustment data corresponds to the EVR (CV-9 board, IC608, IC609, IC804) output voltage, and is as follows.

Adjustment data ( ) is decimal equivalent	EVR output voltage
FF (=255)	Maximum value (approx. 5 Vdc)
↑ F0 (=240)	↑
E0 (=224)	
D0 (=208)	
C0 (=192)	
B0 (=176)	
A0 (=160)	
90 (=144)	
80 (=128)	Center value (approx. 2.5 Vdc)
70 (=112)	
60 (=96)	
50 (=80)	
40 (=64)	
30 (=48)	
20 (=32)	
↓ 10 (=16)	↓
00 (=0)	Minimum value (approx. 0 Vdc)

Table 7-2.

6) The adjustment address is changed using the FF (►►) button or REW (◄◄) button to store the adjustment data in the nonvolatile memory of EVR/AWB microcomputer (IC601 on CV-9 board).
(The new adjustment data is not stored in the nonvolatile memory unless this operation is performed.)

2. Precautions on use of adjustment remote controller

It is possible to accidentally erase correct adjustment data due to an error in operation of the adjustment remote controller. In order to prevent this, we recommend that you make a note of all adjustment data before adjustment and record the new adjustment data after completing each adjustment item.

3. Adjustment address table

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Adjustment Data Memo Column
01	Pin ⑱ of IC609	DELTA R	Auto white balance adjustment	
02	Pin ⑲ of IC609	DELTA B		
03	Pin ② of IC609	TITLE PEDESTAL		
04	Pin ③ of IC609	C-PED	Fixed at “99”	99
05	Pin ④ of IC609	R–Y GAIN	Color reproduction (gain) adjustment	
06	Pin ⑤ of IC609	B–Y GAIN		
07	Pin ⑥ of IC609	R–Y HUE	Color reproduction (hue) adjustment	
08	Pin ⑦ of IC609	B–Y HUE		
09	Pin ⑧ of IC609	C LEVEL		
10	Pin ⑨ of IC609	Y GAIN		
11	Pin ⑫ of IC609	R GAIN	Pre-white balance adjustment	
12	Pin ⑬ of IC609	B GAIN		
13	Pin ⑱ of IC608	C2 GAIN	Chroma matrix adjustment	
14	Pin ⑲ of IC608	C1 GAIN		
15	Pin ② of IC608	Y1 GAIN	Y matrix adjustment	
16	Pin ③ of IC608	HUE CONT	Burst phase adjustment	
17	Pin ④ of IC608	WC	White clip adjustment	
18	Pin ⑤ of IC608	Y LEVEL		
19	Pin ⑥ of IC608	SET UP		
20	Pin ⑦ of IC608	SYNC LEVEL		
21	Pin ⑧ of IC608	APERTURE	Aperture adjustment	
22	Pin ⑨ of IC608	BURST LEVEL		
23		———		–
24	Pin ⑬ of IC608	CHARACTOR		
25	Pin ⑱ of IC804	IRIS		
26	Pin ⑲ of IC804	FOCUS SPEED		
27	Pin ② of IC804	HALL OFFSET		
28	Pin ③ of IC804	MAX GAIN		
29	Pin ④ of IC804	TITLE A/D		
30		———		–
31	Pin ⑥ of IC804	V SUB		
32	Pin ⑦ of IC804	AGC		
33		———		–
34		———		–
35		———		–
36		———		–

Table 7-3. (1)

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Adjustment Data Memo Column</th></tr>
<tr><td>37</td><td></td><td>MODE</td><td>The following adjustment modes are selected by changing the adjustment data.<table>
<tr><th>Adjustment data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Release</td></tr>
<tr><td>01</td><td>Focus hunching</td></tr>
<tr><td>03</td><td>Zoom position</td></tr>
<tr><td>05</td><td>Hall, iris close</td></tr>
<tr><td>07</td><td>Hall, iris open</td></tr>
<tr><td>09</td><td>Hall in/out threshold</td></tr>
<tr><td>0B</td><td>Auto-focus LLA</td></tr>
<tr><td>FD</td><td>Auto-focus filter fixed at FA</td></tr>
<tr><td>FF</td><td>Auto-focus filter fixed at FH</td></tr>
</table></td><td>00</td></tr>
<tr><td>38</td><td></td><td>LLA</td><td>Auto-focus LLA adjustment</td><td></td></tr>
<tr><td>39</td><td></td><td>MACRO</td><td></td><td></td></tr>
<tr><td>40</td><td></td><td>IN/OUT DOOR</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>41</td><td></td><td>LOW CONT</td><td>Auto-focus adjustment</td><td></td></tr>
<tr><td>42</td><td></td><td>BASE H</td><td>Auto-focus adjustment</td><td></td></tr>
<tr><td>43</td><td></td><td>STEP A</td><td>Fixed at 04</td><td>04</td></tr>
<tr><td>44</td><td></td><td>WIDE-THR</td><td>Fixed at 15</td><td>15</td></tr>
<tr><td>45</td><td></td><td>Hysteresis</td><td></td><td></td></tr>
<tr><td>46</td><td></td><td>HALL LEVEL</td><td></td><td></td></tr>
<tr><td>47</td><td></td><td>THR-SEARCH</td><td>Fixed at 06</td><td>06</td></tr>
<tr><td>48</td><td></td><td>FA BASE</td><td>Fixed at 28</td><td>28</td></tr>
<tr><td>49</td><td></td><td>KATAMUKI</td><td>Auto-focus adjustment</td><td></td></tr>
<tr><td>50</td><td></td><td>FH-NG-NG-THR</td><td>Fixed at 05</td><td>05</td></tr>
<tr><td>51</td><td></td><td>BACK RUSH</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>52</td><td></td><td>TOP CHECK SEARCH</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>53</td><td></td><td>TOP LIMIT</td><td>Fixed at 03</td><td>03</td></tr>
<tr><td>54</td><td></td><td>CHECK-PLUS</td><td>Fixed at 50</td><td>50</td></tr>
<tr><td>55</td><td></td><td>MANU-F-SPEED</td><td>Fixed at 04</td><td>04</td></tr>
<tr><td>56</td><td></td><td>M12-THR</td><td>Fixed at C8</td><td>C8</td></tr>
<tr><td>57</td><td></td><td>————</td><td>Not used</td><td>—</td></tr>
<tr><td>58</td><td></td><td>————</td><td>Not used</td><td>—</td></tr>
<tr><td>59</td><td></td><td>START R</td><td>Preset R CONT data for reset start</td><td>30</td></tr>
<tr><td>60</td><td></td><td>START B</td><td>Preset B CONT data for reset start</td><td>41</td></tr>
<tr><td>61</td><td></td><td>BTM SLP R</td><td>Fixed at 22</td><td>22</td></tr>
<tr><td>62</td><td></td><td>BTM SLP B</td><td>Fixed at 10</td><td>10</td></tr>
<tr><td>63</td><td></td><td>MDL SLP R</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>64</td><td></td><td>MDL SLP B</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>65</td><td></td><td>TOP SLP R</td><td rowspan="2">Auto white balance adjustment</td><td></td></tr>
<tr><td>66</td><td></td><td>TOP SLP B</td><td></td></tr>
<tr><td>67</td><td></td><td>KEIKO R</td><td>Fixed at 10</td><td>10</td></tr>
<tr><td>68</td><td></td><td>KEIKO B</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>69</td><td></td><td>BTM UP</td><td>Fixed at 89</td><td>89</td></tr>
<tr><td>70</td><td></td><td>BTM DWN</td><td>Fixed at 61</td><td>61</td></tr>
</table>

Table 7-3. (2)

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Adjustment Data Memo Column</th></tr>
<tr><td>71</td><td></td><td>MDL UP</td><td>Fixed at 7C</td><td>7C</td></tr>
<tr><td>72</td><td></td><td>MDL DWN</td><td>Fixed at 6A</td><td>6A</td></tr>
<tr><td>73</td><td></td><td>TOP UP</td><td rowspan="2">Auto white balance adjustment</td><td></td></tr>
<tr><td>74</td><td></td><td>TOP DWN</td><td></td></tr>
<tr><td>75</td><td></td><td>KEIKO DWN</td><td>Fixed at 8C</td><td>8C</td></tr>
<tr><td>76</td><td></td><td>R DWN LMT</td><td>Fixed at 1E</td><td>1E</td></tr>
<tr><td>77</td><td></td><td>B UP LMT</td><td rowspan="5">Auto white balance adjustment</td><td></td></tr>
<tr><td>78</td><td></td><td>R OUT LMT</td><td></td></tr>
<tr><td>79</td><td></td><td>B OUT LMT</td><td></td></tr>
<tr><td>80</td><td></td><td>R OUTDOOR</td><td></td></tr>
<tr><td>81</td><td></td><td>B OUTDOOR</td><td></td></tr>
<tr><td>82</td><td></td><td>BM DIVID</td><td>Fixed at 23</td><td>23</td></tr>
<tr><td>83</td><td></td><td>DELAY TM</td><td>Auto white balance tracking speed. Fixed at 10</td><td>10</td></tr>
<tr><td>84</td><td></td><td>FAST TM</td><td>Fixed at 20</td><td>20</td></tr>
<tr><td>85</td><td></td><td>CAM DDS 0</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>86</td><td></td><td></td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>87</td><td></td><td></td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>88</td><td></td><td>CAM ALN</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>89</td><td></td><td>AWB mode</td><td>The following auto white balance adjustment modes are selected by changing the adjustment data.
<table>
<tr><th>Adjustment data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Release</td></tr>
<tr><td>10</td><td>White balance value output (within tracking zone)</td></tr>
<tr><td>E0</td><td>Auto white balance adjustment possible</td></tr>
<tr><td>F0</td><td>Auto white balance tracking zone evaluation invalid</td></tr>
</table></td><td>00</td></tr>
</table>

Table 7-3. (3)

7-1-5. Check Point Array

Almost all of the measurement points for camera block adjustment are located in the check point array on the CV-9 board. Solder short lead wires onto the terminals needed for adjustment and connect an oscilloscope, etc.

The terminal numbers and signal names for the check point array are shown in Table 7-4.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	G OUT	B1	R–Y
A2	N.C	B2	B–Y
A3	N.C	B3	Y(LPF)OUT
A4	Y0	B4	V SUB
A5	Y1	B5	AW ADJ
A6	C0	B6	$\overline{\text{CAM ADJ}}$
A7	C1	B7	MODE
A8	N.C	B8	VIDEO OUT
A9	YH	B9	SHUTTER EN
A10	C-OUT	B10	GND
A11	N.C	B11	CCD OUT

Table 7-4.

* N.C...... no connection

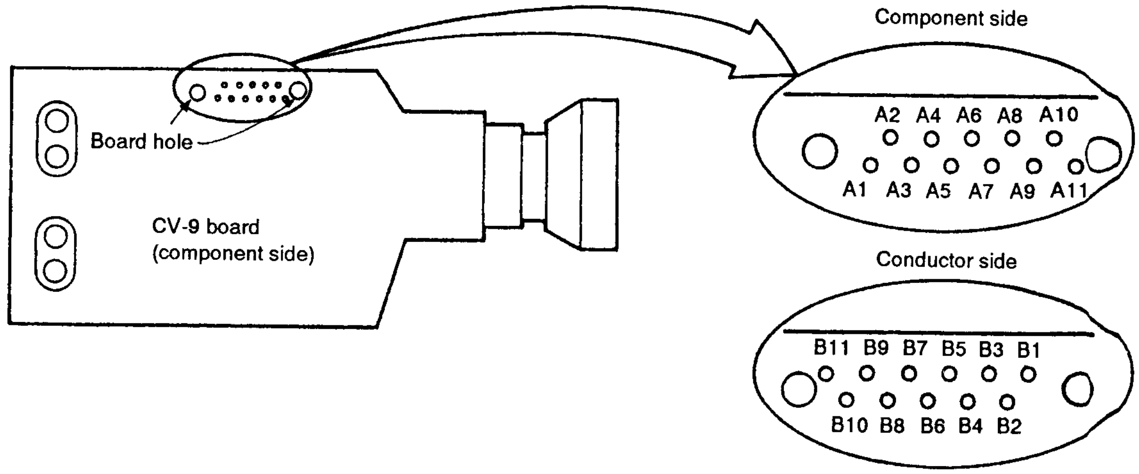

Component side
A2 A4 A6 A8 A10
A1 A3 A5 A7 A9 A11
Board hole
CV-9 board
(component side)
Conductor side
B11 B9 B7 B5 B3 B1
B10 B8 B6 B4 B2

Fig. 7-8.

7-1-6. AF Microcomputer Data Reading Jig

The AF microcomputer data reading jig converts the serial data (output data varies according to hall (iris) state, focus state, focus motor speed, zoom ring position, etc.) for adjustment output from the AF microcomputer (IC802 on CV-9 board) into a 2-digit hexadecimal code and displays it on the LED.

Connections:
Connect as shown in the diagram below.

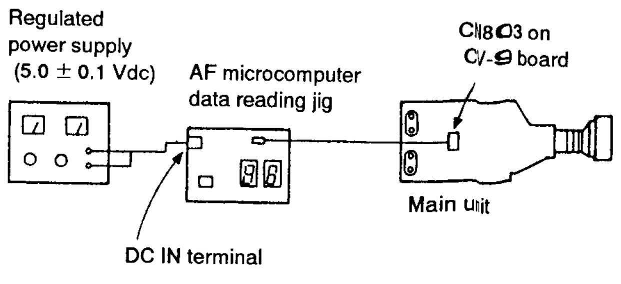

Regulated
power supply
(5.0 ± 0.1 Vdc)
AF microcomputer
data reading jig
CN803 on
CV-9 board
Main unit
DC IN terminal

Fig. 7-9.

7-1-7. Data Processing

For some of the adjustment items, calculation from the data (hexadecimal) indicated on the AF microcomputer data reading jig and adjustment remote controller is needed to obtain the adjustment data. In these cases, convert the hexadecimal values to decimal before calculation and reconvert the result to hexadecimal to obtain the adjustment data. A hexadecimal-decimal conversion table is shown in Table 7-5.

Hexadecimal-Decimal Conversion Table

Hexadecimal lower digit Hexadecimal upper digit	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① → B (b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) is the indication on the jig or adjustment remote commander.

Example: The indication on the jig or adjustment remote commander is BD (b d).
As the upper digit is B (b) and the lower digit is D (d), a decimal value of 189 is obtained from the intersection of ① and ② in the above table.

Table 7-5.

7-2. CAMERA SYSTEM ADJUSTMENT

7-2-1. Flange Back Adjustment

Subject	Siemens star (2m directly in front of lens reference ("⏀" marked)
Measurement Point	Check with a monitor TV
Measuring Instrument	
Adjustment Element	Flange back adjusting pin
Tools	Phillips screwdriver, flat blade (–) screwdriver

Adjustment method:

1) Press the FOCUS switch (S655 on CK-19P board) to set to the MANUAL mode.
2) Position a Siemens star 2m directly in front of the lens reference plane (See Fig. 7-2.).
3) Orient the camera block to have the center of the Siemens star imaged on the monitor TV screen coincide with the monitor screen center.
4) Check to assure the smooth motion of the lens zoom lever to both its extreme WIDE position (8.5 mm) and TELE position (68 mm), and then set it at the extreme WIDE position. (In this process, also check the monitor image to assure proper zooming operation.)
5) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of 07. (Iris open mode) At this time, adjust the illumination on the Siemens star or place an ND filter over the lens, and confirm that the proper image is displayed on the monitor TV screen.
6) Set the lens focusing mark at the center of "2".

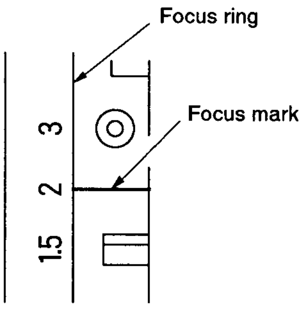


Fig. 7-10.

7) Open the DK-4P board and loosen flange back setscrew ❶ with a Phillips screwdriver. (See Fig. 7-12.)
8) By turning the flange back adjusting pin ❷ while watching the monitor screen, attain the optimum definition of a wedge at the Siemens star center on the screen. (Turn it a few turns to the left and right to ensure optimum definition.)
   Note: Do not turn the adjusting pin excessively in either direction.
9) While holding the flange back adjusting pin ❷ to prevent further rotation, retighten the flange back setscrew ❶.
10) With the zoom lever fixed at its WIDE end, turn the focusing ring and set it to the position that provides the optimum definition image of the wedge. Check to assure the focusing mark position is within the range shown in Fig. 7-11. Also, rotate the focusing ring to the close (1.2m) and far (∞) extremes and confirm that the wedge is no longer in focus.

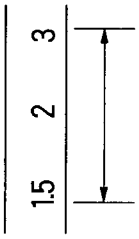


Fig. 7-11.

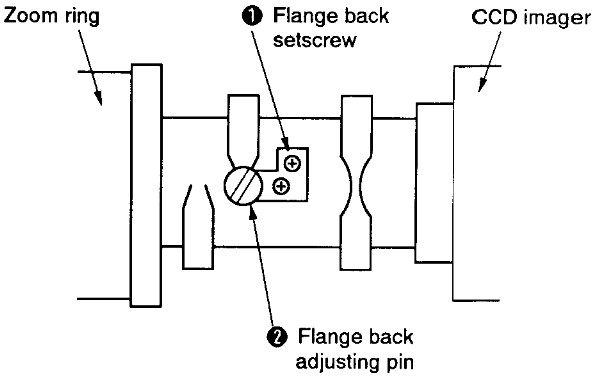


Fig. 7-12.

11) Fix the zoom lever at the extreme TELE position.
12) Turn the focusing ring and stop at the position where the wedge has optimum definition.
    Confirm that the focus mark is within ± 1.5 mm of "2".
13) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of 00. (Iris normal)
14) Change the adjustment address to store the adjustment data in the memory.

7-2-2. 15V Power Supply Adjustment (PS-225P Board)

Measurement Point	Pin ② of W902
Measuring Instrument	Digital voltmeter
Adjustment Element	RV937
Specified Value	15.0 ± 0.5 Vdc

Adjustment method:

1) Adjust to 15.0 ± 0.5 Vdc with RV962.

7-2-3. Power Supply Check (PS-225P Board)

Measuring Instrument	Digital voltmeter
CAM 5V Check	
Measurment Point	Pin ④ of W902
Specified Value	5.05 ± 0.2 Vdc
32V Check	
Measurement Point	Pin ① of W902
Specified Value	32 ± 2 Vdc

Checking method:

1) Each power supply voltage should be at its specified level.

7-2-4. EVR Initial Settings

Set to the following initial settings of the adjustment data only when the EVR/AWB microcomputer (IC602 on CV-9 board) was replaced.

Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value
01 (DELTA R)	50	44 (WIDE THR)	15	67 (KEIKO R)	10
02 (DELTA B)	50	47 (THR SEARCH)	06	68 (KEIKO B)	00
04 (C-PED)	99	48 (FA BASE)	28	69 (BTM UP)	89
16 (HUE CONT)	AE	49 (KATAMUKI)	06	70 (BTM DWN)	61
17 (WHITE CLIP)	FF	50 (FH-NG-NG-THR)	05	71 (MDL UP)	7C
18 (Y LEVEL)	40	51 (BACK RUSH)	02	72 (MDL DWN)	6A
25 (IRIS)	80	52 (TOP CHECK-SEARCH)	02	75 (KEIKO DWN)	8C
28 (MAX GAIN)	B0	53 (TOP LIMIT)	03	76 (R DWN LMT)	1E
31 (V SUB)	80	54 (CHECK-PLUS)	50	82 (AWB)	23
32 (AGC)	FF	55 (MANU-F-SPEED)	04	83 (D TM)	10
37 (MODE)	00	56 (M12-THR)	C8	84 (F TM)	20
38 (LLA)	3F	59 (START R)	30	85 (CAM DDS O)	00
39 (MACRO)	00	60 (START B)	41	86	00
40 (IN/OUT DOOR)	00	61 (BTM SLP R)	22	87	00
41 (LOW CONT)	03	62 (BTM SLP B)	10	88 (CAM ALN)	00
42 (BASE H)	03	63 (MDL SLP R)	00	89 (AWB MODE)	00
43 (STEPA)	04	64 (MDL SLP B)	00		

Table 7-6.

Adjustment method:

1) Set the adjustment data at the various adjustment addresses to the initial values using the adjustment remote controller.
2) Change the adjustment address to store the last adjustment data in the memory.

7-2-5. PLL Adjustment (CV-9 Board)

Measurement Point	Pin ⑳ of IC604
Measuring Instrument	Digital voltmeter
Adjustment Element	CT601
Specified Value	2.5 ± 0.2 Vdc

Adjustment method:

1) Adjust to 2.5 ± 0.2 Vdc with CT601.

7-2-6. V SUB Adjustment (CV-9 Board)

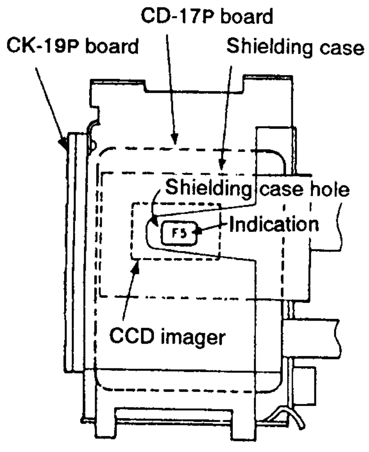
Subject	Not needed
Measurement Point	Pin (B4) (V SUB) of check point array
Measuring Instrument	Digital voltmeter
Adjustment Address	31 (V SUB)
Specified Value	(Voltage indicated by the imager) ± 0.05 Vdc

Adjustment method:

1) Set the adjustment address to 31 using the adjustment remote controller.
2) Change the adjustment data using the adjustment remote controller to set the VSUB voltage (Voltage indicated by the imager) to ± 0.05 Vdc.
3) Change the adjustment address to store the adjustment data in the memory.

Note: The VSUB specified voltage is expressed by two digits with the integer section abbreviation and decimal section by the imager.

Integer section abbreviation	Integer value
1	1
⋮	⋮
9	9
A	10
B	11
C	12
D	13
E	14
F	15
G	16
H	17
I	18
J	19
K	20
L	21



(Example)

If F5 is indicated, the integer value is F → 15 and decimal value is 5 → 0.5. Thus, the VSUB voltage is 15 + 0.5 = 15.5 (Vdc).

Fig. 7-13.

7-2-7. Hall Adjustment (CV-9 Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Element	RV801
Adjustment Address	27 (Hall Offset)
Specified Value	When iris closed: Minimum value of 01 to 04 When iris open: 3D or 3E

Adjustment method:

1) Set the adjustment address to 37 with the adjustment remote controller, and set the adjustment data to 05. (Setting when iris closed)
2) Change the adjustment address to 27.
3) Change the adjustment data until the indication on the AF microcomputer data reading jig is the minimum value in the range of 01 to 04. (Hall offset adjustment)
4) Change the adjustment address to 37 and set the adjustment data to 07. (Setting when iris open)
5) Adjust RV801 until the indication on the AF microcomputer data reading jig is either 3D or 3E. (3D is indicated as 3d .)
6) Repeat steps 1) through 5) until the specified values are satisfied.
7) Set the adjustment address to 37 and set the adjustment data to 00. (Releases adjustment mode)
8) Change the adjustment address to store the adjustment data in the memory.

7-2-8. Iris Adjustment (CV-9 Board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement Point	Pin(B11) (CCD OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	25 (Iris)
Specified Value	360 ± 20 mVp-p

Adjustment method:

1) Set the adjustment address to 25 with the adjustment remote controller.
2) Without attaching an ND filter, change the adjustment data with the adjustment remote controller to set the IRIS OUT signal level to 360 ± 20 mVp-p.
3) Attach the ND filter 0.5 (0.4 ± 0.1) to the front of the lens and confirm that there is a smooth change in the signal level.
4) Remove the ND filter and confirm that the signal level is 360 ± 20 mVp-p.
5) Repeat 2) through 4) if the specified value is not met.
6) Change the adjustment address to store the adjustment data in the memory.

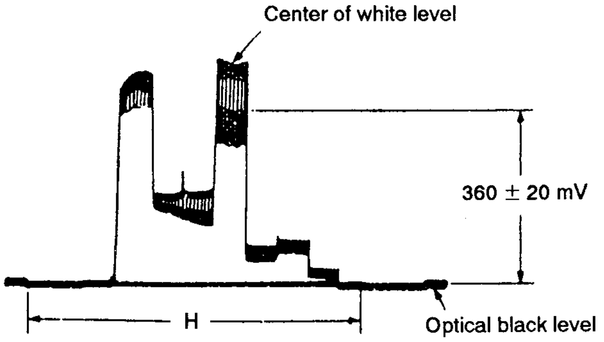


Fig. 7-14.

7-2-9. Iris In/Out Adjustment (CV-9 Board)

Subject	White pattern standard picture frame
Filter	ND filter 0.4 (two) and 0.1 (one)
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	46 (hall level) 45 (hysteresis)

Adjustment method:

1) Cover the lens with the ND filter 0.8 (0.4+0.4).
2) Set the adjustment address to 37 with the adjustment remote controller and set the adjustment data to 09. (Hall in/out threshold mode setting)
3) Read the data indicated on the AF microcomputer data reading jig. This data will be a.
4) Change the adjustment address to 46 and enter a as the adjustment data.
5) Remove the ND filter 0.8 and replace it with ND filter 0.5 (0.4+0.1).
6) Read the data indicated on the AF microcomputer data reading jig. This data will be b.
7) Subtract data b from data a to obtain data c.
   (Refer to Table 7-5. Hexadecimal-Decimal Conversion Table)
   (Example)
   If a=1A and b=15, c=a–b =1A(26) – 15(21) =05
   ( ) indicates decimal value
8) Obtain the hysteresis data from data c using the table below.

Data c	Hysteresis Data
02, 03	01
04, 05, 06	02
07, 08, 09	03

   (Example)
   The hysteresis data is 02 if c=05.
9) Change the adjustment address to 45 and enter the hysteresis data as the adjustment data.
10) Change the adjustment address to 37 and set the adjustment data to 00.
   (Releases hall in/out threshold mode)
11) Change the adjustment address to store the adjustment data in the memory.

7-2-10. AGC Adjustment (CV-9 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (B3) (Y (LPF) OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	32 (AGC)
Specified Value	160 ± 5 mVp-p

Adjustment method:

1) Set the adjustment address to 32 using the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the Y (LPF) signal level to 160 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

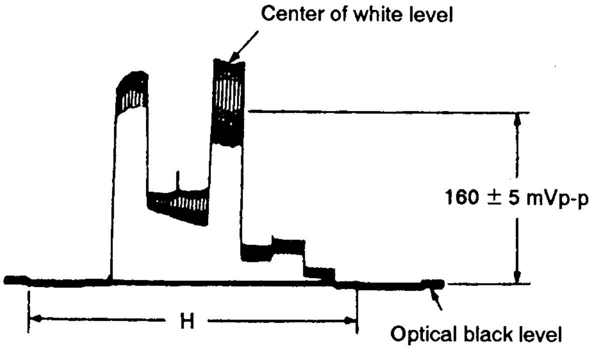


Fig. 7-15.

7-2-11. Y Signal Matrix Adjustment (CV-9 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin (A4) (Y0) of check point array 2: Pin (A5) (Y1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	15 (Y1 GAIN)
Specified Value	Y1 signal level=Y0 signal level

Adjustment method:

1) Connect the oscilloscope to Pin (A4) of the check point array and measure the Y0 signal level.
2) Connect the oscilloscope to Pin (A5) of the check point array.
3) Set the adjustment address to 15 using the adjustment remote controller.
4) Change the adjustment data until the Y1 signal level is the same as the Y0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

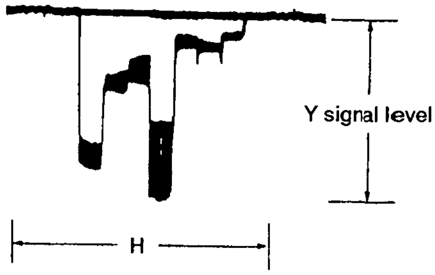


Fig. 7-16.

7-2-12. Chroma Signal Matrix Adjustment (1) (CV-9 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin (A6) (C0) of check point array 2: Pin (A7) (C1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	14 (C1 GAIN)
Specified Value	C1 signal level=C0 signal level

Adjustment method:

1) Connect the oscilloscope to Pin (A6) of the check point array and measure the C0 signal level. (The C0 signal level is the larger of the CR and CB signal levels.)
2) Connect the oscilloscope to Pin (A7) of the check point array.
3) Set the adjustment address to 14 using the adjustment remote controller.
4) Change the adjustment data until the C1 signal level is the same as the C0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

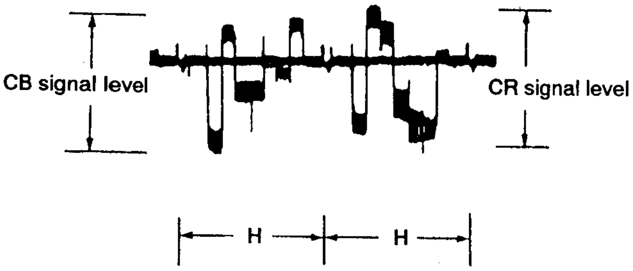


Fig. 7-17. C0 and C1 signal levels

7-2-13. Chroma Signal Matrix Adjustment (2) (CV-9 Board)

Subject	Color bar standard picture frame
Measurement Point	CH1 (X): Pin (B2) (B–Y) of check point array or collector of Q643 CH2 (Y): Pin (B1) (R–Y) of check point array or collector of Q613
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	13 (C2 GAIN)
Specified Value	Separate color luminance points become one.

Note: Adjustment can be made in the same manner using a vectorscope.
(Vectorscope connection terminal: video output terminal)

Adjustment method:

1) Set the adjustment address to 13 using the adjustment remote controller.
2) Change the adjustment data so that the two separate color luminance points become one respectively.
3) Change the adjustment address to store the adjustment data in the memory.

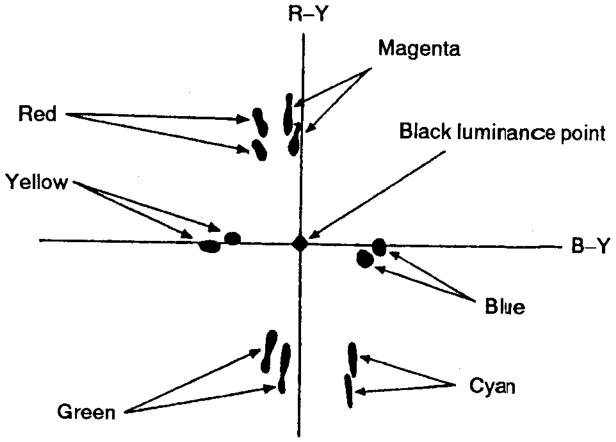


Fig. 7-18.

7-2-14. YH Level Adjustment (CV-9 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A9) (YH) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	10 (Y GAIN)
Specified Value	900 ± 40 mVp-p

Adjustment method:

1) Set the adjustment address to 10 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the YH signal level to 900 ± 40 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

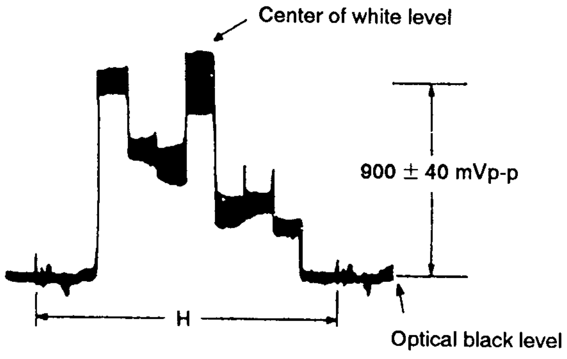


Fig. 7-19.

7-2-15. Sync Level Adjustment (CV-9 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	20 (SYNC LEVEL)
Specified Value	150 ± 5 mVp-p

Adjustment method:

1) Set the adjustment address to 20 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the sync level to 150 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

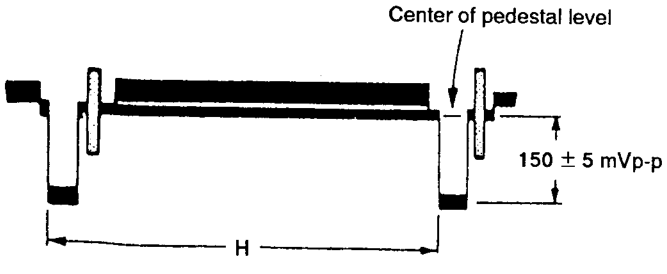


Fig. 7-20.

7-2-16. Setup Adjustment (CV-9 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	19 (SET UP)
Specified Value	15 ± 5 mV

Note: 1) and 2) are steps taken to reduce noise.

Adjustment method:

1) Set the address to 21 (APERTURE) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this at address.
2) Set the address to 28 (MAX GAIN) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
3) Set the adjustment address to 19 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the setup level to 15 ± 5 mV.
5) Set the adjustment address to 21 and enter the adjustment data recorded in 1).
6) Set the adjustment address to 28 and enter the adjustment data recorded in 2).
7) Change the adjustment address to store the adjustment data in the memory.

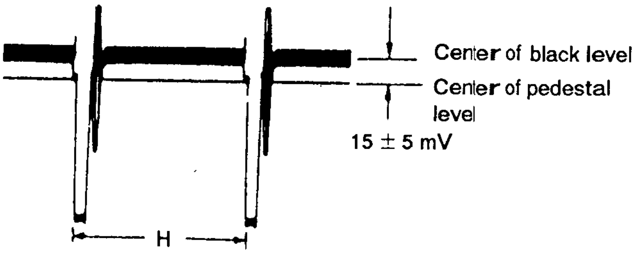


Fig. 7-21.

7-2-17. Y Level Adjustment (CV-9 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	18 (Y LEVEL)
Specified Value	315 ± 10 mV

Adjustment method:

1) Set the adjustment address to 17 with the adjustment remote controller, and make a note of the adjustment data for this address.
2) Set the adjustment data to FF with the adjustment remote controller.
3) Set the adjustment address to 18 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the Y signal level to 315 ± 10 mV.
5) Set the adjustment address to 17 and enter the adjustment data recorded in 1).
6) Change the adjustment address to store the adjustment data in the memory.

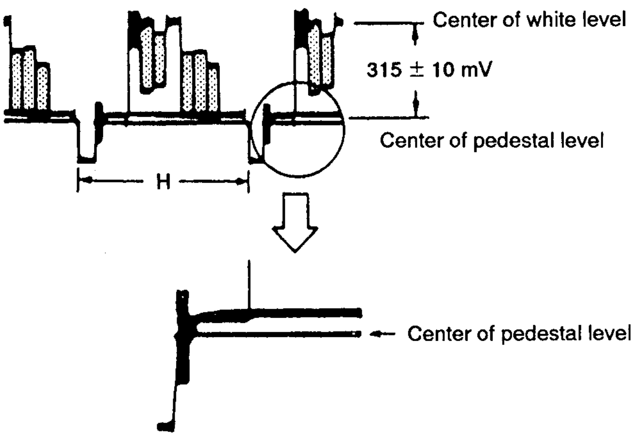


Fig. 7-22.

7-2-18. White Clip Adjustment (CV-9 Board)

Subject	High luminance pattern
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	17 (WHITE CLIP)
Specified Value	420 ± 10 mV

Adjustment method:

1) Set the adjustment address to 18 with the adjustment remote controller, and make a note of the adjustment data for this address.
2) Set the adjustment data to 40 with the adjustment remote controller.
3) Set the adjustment address to 17 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the white clip level to 420 ± 10 mV.
5) Set the adjustment address to 18 and enter the adjustment data recorded in 1).
6) Change the adjustment address to store the adjustment data in the memory.

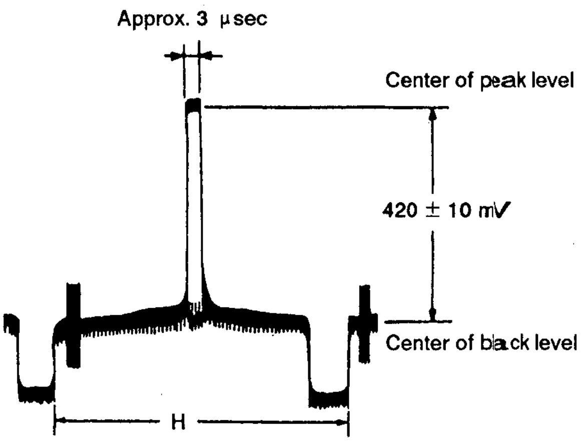


Fig. 7-23.

7-2-19. Aperture Adjustment (CV-9 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Emitter of Q602
Measuring Instrument	Oscilloscope
Adjustment Address	21 (APERTURE)
Specified Value	70 ± 10 mV

Adjustment method:

1) Focus the camera and set the aperture level (lower peak between green and white) to maximum.
2) Change the adjustment data to set the lower peak between green and white to 70 ± 10 mV above the pedestal level.
3) Change the adjustment address to store the adjustment data in the memory.

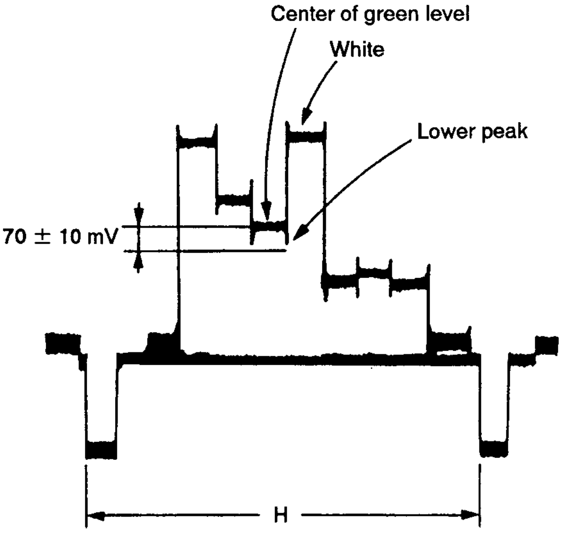


Fig. 7-24.

7-2-20. Max. Gain Adjustment (CV-9 Board)

Subject	Color bar chart standard picture frame
Filter	ND filters 1.0 (two) and 0.3 (two)
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	28 (MAX GAIN)
Specified Value	170 ± 10 mV

Adjustment method:

1) Cover the lens with the ND filter 2.6 (1.0+1.0+0.3+0.3).
2) Set the adjustment address to 28 with the adjustment remote controller.
3) Change the adjustment data with the adjustment remote controller to set the Y signal level to 170 ± 10 mV.
4) Change the adjustment address to store the adjustment data in the memory.

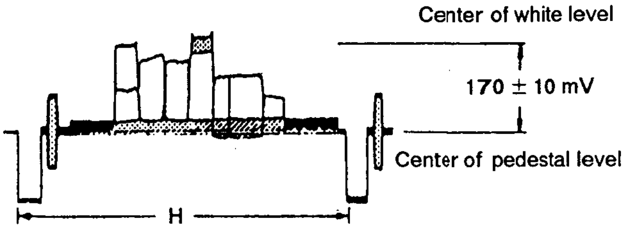


Fig. 7-25.

7-2-21. Chroma Level Adjustment (CV-9 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A1) (G OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	09 (C LEVEL)
Specified Value	320 ± 20 mVp-p

Connections:

1) Connect Pin (B7) (MODE) of the check point array to GND using a jumper wire.

Adjustment method:

1) Set the adjustment address to 09 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the G OUT signal level to 320 ± 20 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

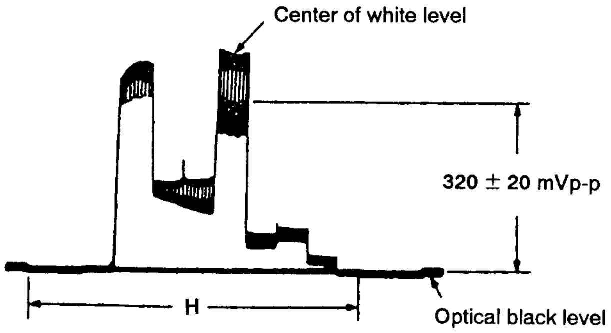


Fig. 7-26.

7-2-22. Indoor White Balance Adjustment (Method Using Vectorscope)

Subject	White pattern standard picture frame
Measurement Point	Video output terminals
Measuring Instrument	Vectorscope
Adjustment Address	11 (R GAIN) 12 (B GAIN)
Specified Value	The white luminance point is within a circle with a diameter of 1 mm centered around the origin.

Adjustment method:

1) Set the adjustment address to 11 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to move the white luminance point to the origin point.
3) Set the adjustment address to 12.
4) Change the adjustment data to move the white luminance point to the origin point.
5) Repeat steps 1) through 4).
6) Change the adjustment address to store the adjustment data in the memory.

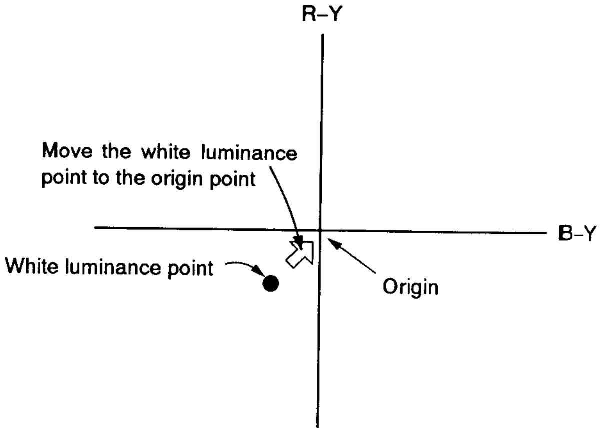


Fig. 7-27.

7-2-23. Indoor White Balance Adjustment (Method Using Oscilloscope) (CV-9 Board)

Subject	White pattern
Measurement Point	CH1 (X): Pin Ⓑ2 (B–Y) of check point array or collector of Q643 CH2 (Y): Pin Ⓑ1 (R–Y) of check point array or collector of Q613
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	11 (R GAIN) 12 (B GAIN)
Specified Value	Move the white luminance point to the black luminance point.

Adjustment method:

1) Set the adjustment address to 11 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to move the white luminance point with the black luminance point.
3) Set the adjustment address to 12.
4) Change the adjustment data to move the white luminance point to the black luminance point.
5) Repeat steps 1) through 4).
6) Change the adjustment address to store the adjustment data in the memory.

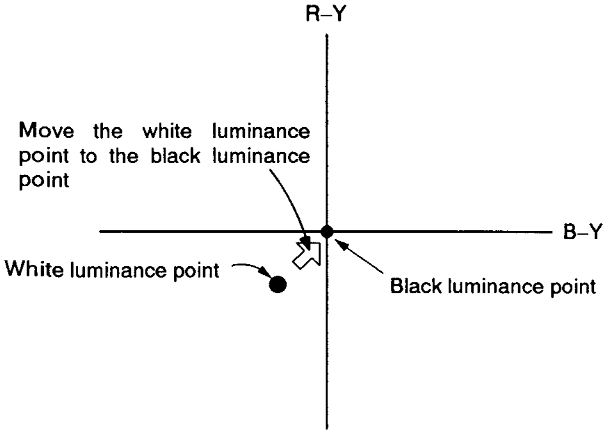


Fig. 7-28.

7-2-24. Burst Phase Adjustment (Method Using Vectorscope)

Subject	All black (cover lens with black cap)
Measurement Point	Video output terminals
Measuring Instrument	Vectrscope
Adjustment Address	16 (HUE CONT)
Specified Value	135° ± 1°

Adjustment method:

1) Set adjustment address to 16 with the adjustment remote controller.
2) Change adjustment data so as to set the burst luminance point in the 135° ± 1° position.
3) Change the adjustment address to store the adjustment data in the memory.
4) Perform Burst Level Adjustment.

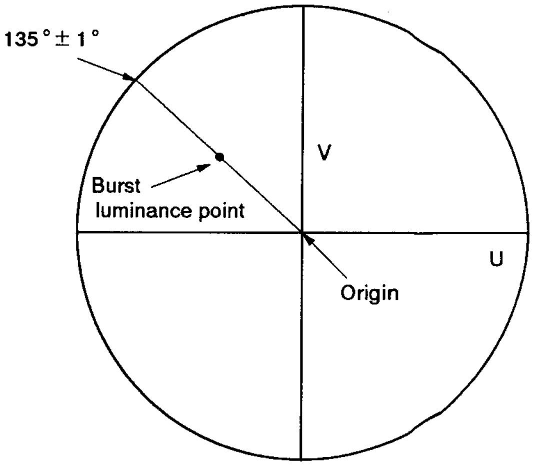


Fig. 7-29.

7-2-25. Burst Phase Adjustment (CV-9 Board) (Mothod Using Oscilloscope)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope (Trigger slope:+)
Adjustment Address	16 (HUE CONT)
Specified Value	Burst phase should become a single line.

Adjusing method:

1) Set adjustment address to 16 with the adjustment remote controller.
2) Change the adjustment data so as to turn the burst waveform into a single line.
3) Change the adjustment address to store the adjustment data in the memory.
4) Perform Burst Level Adjustment.

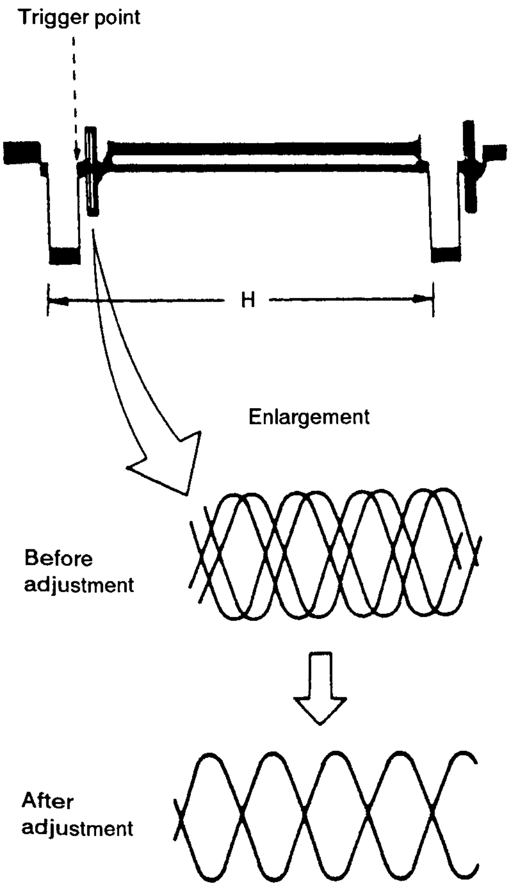


Fig. 7-30.

7-2-26. Burst Level Adjustment (CV-9 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	22 (BURST LEVEL)
Specified Value	150 ± 5 mVp-p

Adjustment method:

1) Set the adjustment address to 22 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the burst level to 150 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

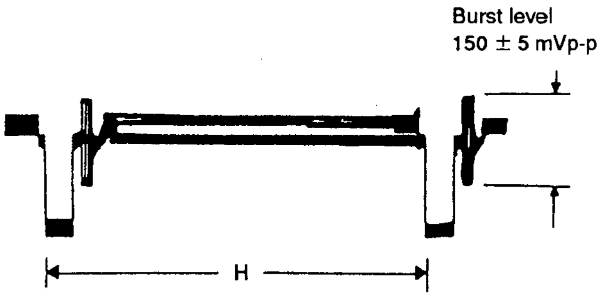


Fig. 7-31.

7-2-27. Color Reproduction Adjustment (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminals
Measuring Instrument	Vectorscope
Adjustment Address	05 (R-Y GAIN) 06 (B-Y GAIN) 07 (B-Y HUE) 08 (R-Y HUE)
Specified Value	All color luminance points are within color reproduction frame.

Note: Confirm that Burst Phase Adjustment, Burst Level Adjustment and Indoor White Balance Adjustment have been completed.

Adjustment method:

1) Adjust the phase and gain of the vectorscope to set the burst luminance points to the designated position on the color reproduction frame.
2) Change the adjustment data at the various adjustment addresses using the adjustment remote controller until all color luminance points are within the color reproduction frame.
3) Change the adjustment address to store the adjustment data in the memory.

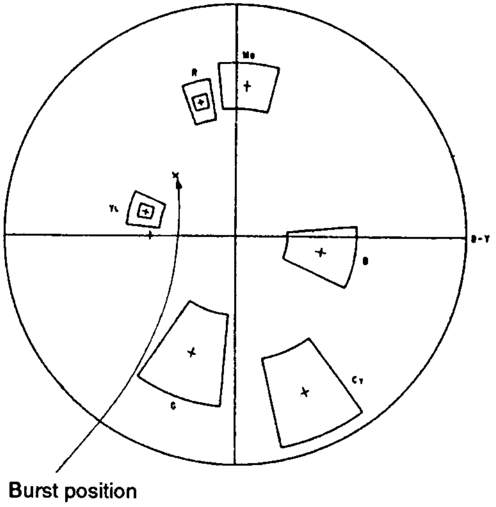


Fig. 7-32.

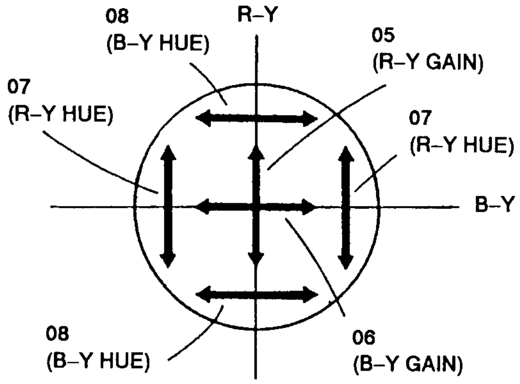


Fig. 7-33. Adjustment address and direction of luminance point movement

7-2-28. Color Reproduction Adjustment (Method Using Oscilloscope)

1. Gain adjustment (CV-9 board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	05 (R-Y GAIN) 06 (B-Y GAIN)
Specified Value	Red level: 244 ± 15 mVp-p Yellow level: 180 ± 11 mVp-p

Note: Confirm that Indoor White Balance Adjustment has been completed.

Adjustment method:

1) Set the adjustment address to 06 with the adjustment remote controller and set the adjustment data to B0.
2) Set the adjustment address to 07 and set the adjustment data to B0.
3) Set the adjustment address to 08 and set the adjustment data to B0.
4) Set the adjustment address to 05 and change the adjustment data to set the chroma signal red level to 244 ± 15 mVp-p.
5) Set the adjustment address to 06 and change the adjustment data to set the chroma signal yellow level to 180 ± 11 mVp-p.
6) Repeat steps 4) and 5).
7) Change the adjustment address to store the adjustment data in the memory.
8) Perform Hue Adjustment.

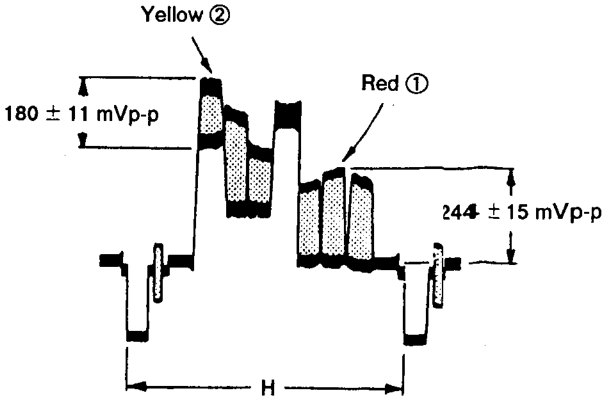


Fig. 7-34.

2. Hue adjustment

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): Pin (B2) (B–Y) of check point array or collector of Q643 CH2 (Y): Pin (B1) (R–Y) of check point array or collector of Q613
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	07 (R–Y HUE) 08 (B–Y HUE)
Specified Value	Various color luminance points within color reproduction frame.

Note: Make sure that Indoor White Balance Adjustment has been completed.

Adjustment method:

1) Move the black luminance point on the oscilloscope to the origin point of the color reproduction frame.
2) Change the adjustment data at adjustment addresses 07 and 08 with the adjustment remote controller to bring the various color luminance points into the color reproduction frame.
3) Check the hue reproduced on the monitor TV and fine adjust the adjustment data at adjustment addresses 07 and 08 if necessary.
4) Change the adjustment address to store the adjustment data in the memory.

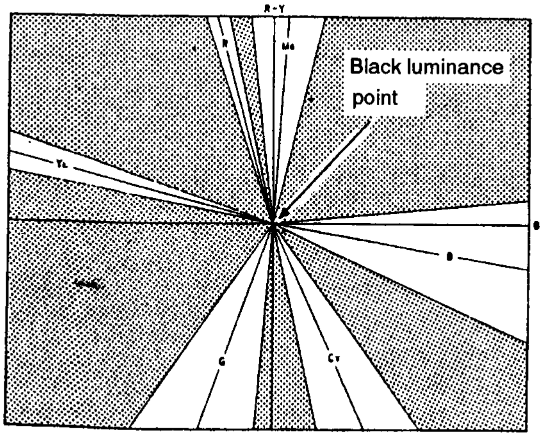


Fig. 7-35.

7-2-29. Auto White Balance Adjustment

Note: Be sure to first perform Preset Adjustment followed by Auto White Balance Adjustment.

1. Preset adjustment (CV-9 board)

Subject	White pattern standard picture frame

Note: 1) Perform preset adjustment after supplying power to the unit for at least 30 seconds.
2) When performing preset adjustment again, repeat after first turning the power off and then back on.

Preparations:

1) Prepare a 1 kΩ resistor for connecting Pin (B5) (AWB ADJ) of the check point array and Pin ④ (CAM 5V) of W902.

Adjustment method:

1) Turn the power OFF and then ON, and connect Pin (B6) (CAM ADJ) of the check point array to GND using a jumper wire.
2) Select adjustment address 89 (AWB MODE) and set the adjustment data to E0. Wait at least five seconds.
3) Change the adjustment address to store the adjustment data in the memory. Wait at least five seconds.
4) Remove the jumper wire between Pin (B6) (CAM ADJ) of the check point array and GND.
5) Connect Pin (B5) (AWB ADJ) of the check point array and Pin ④ of W902 (CAM 5V)with a 1 kΩ resistor.
6) Connect Pin (B6) (CAM ADJ) of the check point array to GND using a jumper wire.
7) Connect that the indication (adjustment address 01) of the adjustment remote controller is changed.
8) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array after allowing one second or more to elapse.
9) Remove the 1 kΩ resistor connected to Pin (B5) (AWB ADJ) of the check point array.
10) Connect Pin (B6) (CAM ADJ) of the check point array to GND using a jumper wire.

2. Auto white balance adjustment (CV-9 board)

Note: Be sure to perform this adjustment after completing Preset Adjustment.

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measuring Instrument	Oscilloscope (X-Y Mode)
Measurement Point	CH1 (X): Pin (B2) (B–Y) of check point array or collector of Q643 CH2 (Y): Pin (B1) (R–Y) of check point array or collector of Q613
Adjustment Address	01 (DELTA R) 02 (DELTA B) 80 (R OUTDOOR) 81 (B OUTDOOR) 77 (B UP LIMIT) 78 (R OUT LIMIT) 79 (B OUT LIMIT) 65 (TOP SLP R) 66 (TOP SLP R) 73 (TOP UP) 74 (TOP DWN)
Specified Value	Move the white luminance point to the black luminance point.

Note: 1) Make connection to the video output terminals when the vectorscope is used.
2) All calculations in this section are made in decimal.

Adjustment method:

1) Select adjustment address 89 (AWB MODE) with the adjustment remote controller and enter adjustment data of 10.
2) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote controller to move the white luminance point and black luminance point.
(Move the white luminance point to pthe origin point when using the vectorscope.)
The adjustment data of adjustment address 01 is D_1 and the adjustment data of adjustment address 02 is D_2.
3) Select adjustment address 78 to enter adjustment data D_1.
4) Convert adjustment data D_1 to decimal to obtain D_1'.
Convert adjustment data D_2 to decimal to obtain D_2'.
(See Table 7-5 Hexadecimal-Decimal Conversion Table)
5) Obtain D_{80}' and D_{81}' by the following formula.
$D_{80}'=D_1'+1$
$D_{81}'=D_2'+3$
6) Convert D_{80}' and D_{81}' to hexadecimal and call this value D_{80} and D_{81}.
7) Select adjustment address 80 and enter adjustment data D_{80}.
Select adjustment address 81 and enter adjustment data D_{81}.
(Outdoor white balance adjustment.)
8) Obtain D_{77}' by the following formula.
$D_{77}'=(D_2' \times 1.9)-43.2$
9) Convert D_{77}' to hexadecimal and call this value D_{77}.
(Round off the decimal portion)
10) Select adjustment address 77 with the adjustment remote controller and enter adjustment data D_{77}.
11) Obtain D_{79}' by the following formula.
$D_{79}'=D_2'+10$
12) Convert D_{79}' to hexadecimal and call this value D_{79}.
13) Select adjustment address 79 with the adjustment remote controller and enter adjustment data D_{79}.
14) Obtain d' by the following formula.
$d'=(D_1' \times 5)+D_2'$
The adjustment procedure in 15) through 17) varies according to the value of d'.

[d' > 308]

15) Obtain D_{73}' and D_{74}' by the following formulas.
$D_{73}'=(D_1' \times 3)+(D_2' \div 2)+30$
$D_{74}'=D_{73}'-42$
16) Convert D_{73}' and D_{74}' to hexadecimal and call these values D_{73} and D_{74}.
(Round off the decimal portion)
17) Use the adjustment remote controller to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	20
66	01
73	D_{73}
74	D_{74}

Perform the adjustment steps beginning from 18).

[308 ≧ d' ≧ 286]

15) Obtain D_{73}' and D_{74}' by the following formulas.
$D_{73}'=(d' \div 2)+25$
$D_{74}'=D_{73}'-39$
16) Convert D_{73}' and D_{74}' to hexadecimal and call these values D_{73} and D_{74}.
(Round off the decimal portion)
17) Use the adjustment remote controller to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	41
66	01
73	D_{73}
74	D_{74}

Perform the adjustment steps beginning from 18).

[286 > d']

15) Obtain D_{73}' and D_{74}' by the following formulas.
$D_{73}'=(D_1' \times 3) + D_2'+30$
$D_{74}'=D_{73}'-42$
16) Convert D_{73}' and D_{74}' to hexadecimal and call these values D_{73} and D_{74}. (Round off the decimal portion)
17) Use the adjustment remote controller to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	20
66	00
73	D_{73}
74	D_{74}

18) Select adjustment address 89 and enter adjustment data 00.
19) Select adjustment address 89 and enter adjustment data F0.
20) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote controller to move the white luminance point and black luminance point.
(Move the white luminance point to the origin point when using the vectorscope.)
21) Select adjustment address 89 and enter adjustment data of 00.
22) Change the adjustment address to store the adjustment data in the memory.

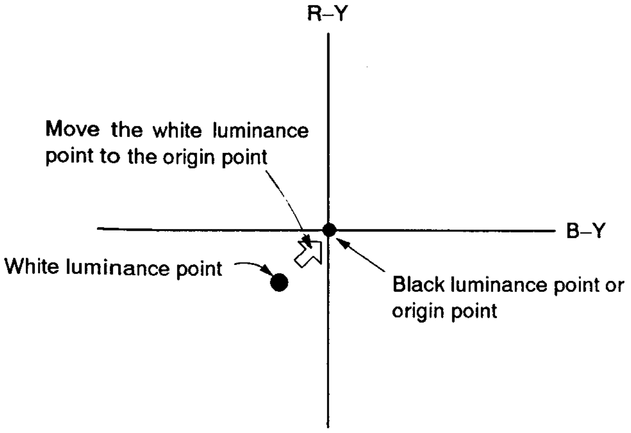

R-Y
Move the white luminance point to the origin point
B-Y
White luminance point
Black luminance point or origin point

Fig. 7-36.

(Example)
When the adjustment data obtained in Step 2) has the following values.

Adjustment address	Adjustment data
01	2A
02	53

→ Entered into adjustment address 78.

D_1=2A and D_2=53 when there is conversion to decimal using Table 7-5.
$D_1'=42$
$D_2'=83$

Thus,
$D_{80}'=42+1=43$
$D_{81}'=83+3=86$
$D_{77}'=(83 \times 1.9)-43.2=114.5$

Rounding off the decimal portion and converting to hexadecimal by Table 7-5 results in,
D_{80}=2B → Entered into adjustment address 80.
D_{81}=56 → Entered into adjustment address 81.
D_{77}=72 → Entered into adjustment address 77
In the same manner,
$D_{79}'=(83+10)=93$
D_{79}=5D → Entered into adjustment address 79

In addition,
$d'=(42 \times 5)+83=293$

Thus, $[308 \geqq d' \geqq 286]$
$D_{73}'=(293 \div 2)+25=171.5$
$\therefore$ D_{73}=AC → Entered into adjustment address 73
$D_{74}'=171.5-39=132.5$
$\therefore$ D_{74}=85 → Entered into adjustment address 74

Also, adjustment data of 41 is entered into adjustment address 65, and adjustment data of 01 is entered into adjustment address 66.
The steps beginning from 18) are then performed.

7-2-30. Outdoor White Balance Confirmation (CV-9 Board)

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	When vectorscope used: video output terminals When oscilloscope used: CH1 (X): Pin (B2) (B–Y) of check point array or collector of Q643 CH2 (Y): Pin (B1) (R–Y) of check point array or collector of Q613
Measuring Instrument	
Specified Value	See Fig. 7-37.

Connections:

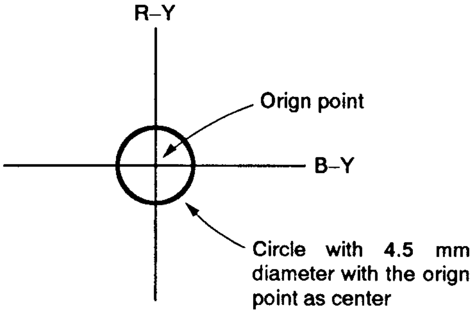
1) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array. (Turns off the EVR adjustment mode)

Checking method:

1) Press the white balance button to select the outdoor white balance mode. (☀ mark is displayed on EVF screen or monitor TV screen (when data screen ON).)
2) Confirm that the center of the white luminance point is within the circle shown in the figure below.

   Note: When using a vectorscope, adjust the GAIN and PHASE of the vectorscope so that burst luminance point move to with the burst position of the color reproduction frame.

[When using vectorscope]



[When using oscilloscope]

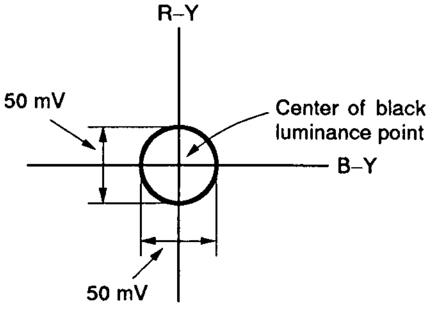


Fig. 7-37.

7-2-31. Focus Motor Speed Adjustment (CV-9 Board)

Subject	Arbitrary
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	A26 (FOCUS SPEED)
Specified Value	Average value of data indicated on jig=4.0 ± 0.5

Remarks: The rotation time from the close extreme to far extreme of the focus ring should be approximately 2.1 seconds after completion of adjustment.

Adjustment method:

1) Turn on the auto focus with FOCUS button (S655 on CK-19P board).
2) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of 01. (Sets hunching mode)
3) Set the adjustment address to 26.
4) Change the adjustment data so that the indication on the AF microcomputer data reading jig is 04 while the ring is rotating.
5) Press the HOLD button of the AF microcomputer data reading jig while the focus ring is rotating to read the indication value.
6) Repeat step 4) ten times and obtain the average value.
   Specified value=4.0 ± 0.5
   Repeat steps 3) and 4) if the specified value is not satisfied.
7) Set the adjustment address to 37 and set the adjustment data to 00. (Releases hunching mode)
8) Change the adjustment address to store the adjustment data in the memory.

7-2-32. Macro Area Adjustment (CV-9 Board)

Subject	Arbitrary
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	39 (MACRO)
Specified Value	(Value at WIDE position) +3

Adjustment method:

1) Set the zoom ring to the WIDE position (8.5 mm position).
2) Select adjustment address 37 with the adjustment remote controller and set the adjustment data to 03. (Sets zoom position indication mode)
3) Read the data indicated on the AF microcomputer data reading jig. (Data in the range of 00 to 0E is displayed if normal.)
4) Change the adjustment address to 39.
5) Add 3 to the data read from jig and enter as the adjustment data.
6) Change the adjustment address to 37 and set the adjustment data to 00. (Releases zoom position indication mode)
7) Change the adjustment address to store the adjustment data in the memory.

7-2-33. Auto-Focus LLA Adjustment (CV-9 Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	38 (LLA)
Specified Value	(Value indicated on jig) –2

Adjustment method:

1) Select adjustment address 37 with the adjustment remote controller and set to 0B as the adjustment data. (Sets auto-focus LLA adjustment mode)
2) Read the data indicated on the AF microcomputer data reading jig and call this value D.
3) Subtract 2 from D and make this value the LLA data.
   (See Table 7-5. Hexadecimal-Decimal Conversion Table)

> (Example)
> When D=30 (48), LLA data is 2D (46)
> When D=31 (49), LLA data is 2F (47)
> ( ) is decimal equivalent

4) Select adjustment address 38 with the adjustment remote controller and enter the LLA data as the adjustment data.
5) Select adjustment address 37 and set 00 as the adjustment data. (Releases auto-focus LLA adjustment mode)
6) Change the adjustment address to store the adjustment data in the memory.

7-2-34. Auto-Focus Adjustment

1. Adjustment in all black pattern (CV-9 board)

Subject	All black (cover lens with black cap)
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	42 (BASE-H)

Adjustment method:

1) Turn off the auto-focus with the FOCUS button (S655 on CK-19P board).
2) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of FF.
3) Read the indication on the AF microcomputer data reading jig and confirmm this value (FHB). (FHB should be 00 to 07.)
4) Obtain adjustment data D42 according to the following formulas.
   When FHB=0
   D42=03
   When FHB > 0
   D42=FHB+2 * Hexadecimal calculations
5) Select adjustment address 42 with the adjustment remote controller and enter D42 as the adjustment data.
6) Select adjustment address 37 and enter adjustment data of 00.
7) Change the adjustment address to store the adjustment data in the memory.
8) Perform "Adjustment in white pattern" .

2. Adjustment in white pattern (CV-9 board)

Subject	White pattern standard picture frame (Position 1.5 m from the front of the lens reference plane (φ mark))
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	41 (LOW CONT)

Measurement method:

1) Confirm that the white pattern is not soiled.
2) Confirm that the auto-focus is turned off.
3) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of FD.
4) Read the indication of the AF microcomputer data reading jig and confirm this value (FAW). (FAW shoud be 00 to 03)
5) Obtain adjustment data D41 according to the following formulas.
   D41=FAW+3
6) Select adjustment address 41 with the adjustment remote controller and enter D41 as the adjustment data.
7) Select adjustment address 37 and enter adjustment data of 00.
8) Chenge the adjustment address to store the adjustment data.
9) Perform "Adjustment in Siemens star" .

3. Adjustment in Siemens star (CV-9 board)

Subject	Siemens Star (1.5m in front of the lens reference surface (⌽ mark))
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	49 (KATAMUKI)
Specified Value	03 ≦ KATAMUKI<0D

Measurement method:

1) Place the Siemens Star 1.5m in front of the lens reference surface (see Fig. 7-2).
2) Set the zoom lever to the TELE end (68 mm) and turn auto-focus off with the FOCUS button (S655 on the CK-19P board).
3) Adjust camera position so that the center of the Siemens Star displayed on the monitor coincides with the center of the monitor screen.

Illumination Adjustment:

1) Select adjustment address 37 and input adjustment data 09 with the adjustment remote controller (this will cause iris condition to be displayed on the AF microcomputer data reading jig (henceforth referred to as AF jig)).
2) Put a black cap on the lens and read the AF jig indication (value for fully-open iris).
3) Remove the black cap and confirm that the AF jig indication drops below the fully-open value (in case the iris remains fully open, increase Siemens Star illumination).
4) Lower Siemens Star illumination gradually (if using ND filters, gradually increase the ND value). Stop when the AF jig indication reaches the fully-open iris value-2 from the fully-open iris value. (Confirm that the screen does not get dark.)

Auto-focus Adjustment:

1) Set the focus ring to the close-range end (1.2m) and the zoom lever to the TELE end (68 mm), then turn auto-focus on with the FOCUS button.
2) After 2.0 seconds, confirm that the Siemens Star is being clearly reproduced, then press the FOCUS button to turn auto-focus off.
3) Select adjustment address 37 and input adjustment data FF with the adjustment remote controller (the auto-focus filter will be set to the FH side).
4) Read the AF jig indication, and call the data D, and then convert it to the decimal number D'. Then obtain FHSM' by the following formula:
   FHSM'=D'/2.5
   (FHSM' shall be within 16 to 55)
5) Select adjustment address 37 and input adjustment data FD with the adjustment remote controller (the auto-focus filter will be set to the FA side).
6) Read the AF jig indication, and call the data D, and then convert it to the decimal number D'. Then obtain FASM' by the following formula:
   FASM'=D'/1.6
   (FASM' shall be within 78 to 112)
7) Obtain D49' by the following formula:

$$D_{49}' = \frac{FHSM' - FHB - 4}{FASM' - 40} \times 16$$

   - FHB is the adjustment data for the all-black pattern.
8) Convert D49' to the hexadecimal number D49 (Round off the decimal portion. D49 shall be within 03 to 0D).
9) Select adjustment address 49 and input adjustment data D49.
10) Select adjustment address 37 and input adjustment data 00.

7-2-35. Auto-Focus Confirmation

Subject	Siemens star (position 1.5m from the front of the lens reference plane ("Φ" mark)

Note: Perform adjustment with the EVF (electronic viewfinder) attached.

Measuring method:

1) Place the Siemens star 1.5m from the front of the lens reference surface (See Fig. 7-2.).
2) Set the zoom lever to the TELE position (68 mm) and turn on auto focus with the FOCUS button.
3) Adjust the direction of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.
4) To open the iris, reduce the illumination of the Siemens star to the range in which the ■ mark in the upper center of the EVF screen does not light up.
   (Or cover lens with the ND filter)
5) Turn off the auto-focus with the FOCUS button.
6) Manually rotate the focus ring to set the focus. Confirm that the focus mark is inside the range shown in Fig. 7-38 at this time.
   Perform Flange Back Adjustment if this condition is not satisfied.
7) Rotate the focus ring to the close extreme (1.2m).
8) Turn on the auto-focus with the FOCUS button.
9) Confirm that there is focusing within two seconds and a sharp image can be obtained.
10) Turn off the auto-focus and rotate the focus to the far extreme (∞).
11) Turn on the auto-focus.
12) Confirm that there is focusing within three seconds and a sharp image can be obtained.

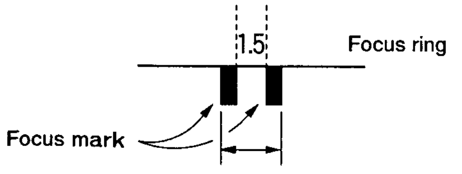

1.5
Focus ring
Focus mark
Confirm that focus mark is within this range

Fig. 7-38.

7-3. DIGITAL TITLER SYSTEM ADJUSTMENT

7-3-1. Titler PLL Adjustment (LI-10 Board)

Subject	Arbitrary
Measurement Point	C910 (see Fig. 7-39.)
Measuring Instrument	Digital voltmeter
Adjustment Address	CV901
Specified Value	2.5 ± 0.1 Vdc

Note: Remove the three boards LI-10, CK-19P and DK-4P together with their mounting frame before adjustment.

Connection:

1) Connect Pin ⑧ (SS5V) of IC901 to the check land (Pin (64) of IC902) with a jumper wire (see Fig. 7-40.).

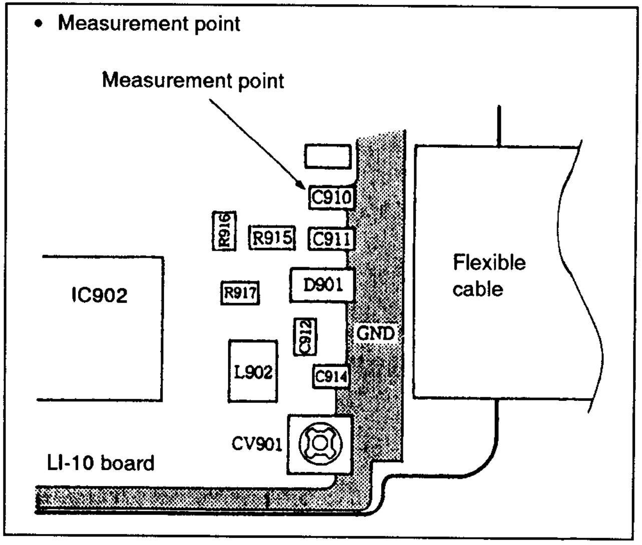
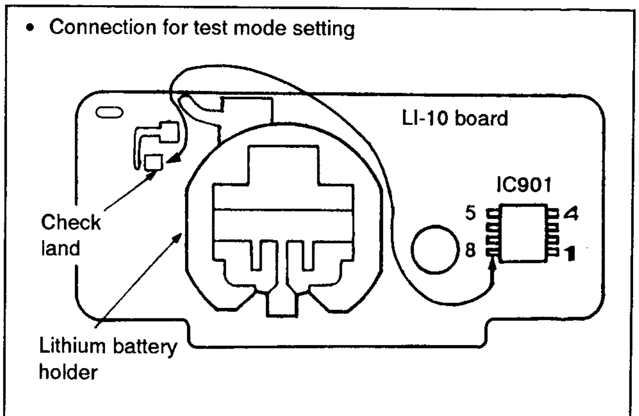

• Measurement point
Measurement point
C910
R916
R915
C911
IC902
R917
D901
Flexible cable
C912
GND
L902
C914
CV901
LI-10 board

Fig. 7-39.


• Connection for test mode setting
LI-10 board
IC901
5
4
8
1
Check land
Lithium battery holder

Connect Pin ⑧ (SS5V) of IC901 to the check land (Pin (64) of IC902) with a jumper wire.

Fig. 7-40.

Adjustment method:

1) Set to 2.5 ± 0.1 Vdc with CV901.

7-3-2. Title A/D Level Adjustment (LI-10 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Check on the monitor screen
Measuring Instrument	
Adjustment Address	29 (TITLE A/D)
Specified Value	All areas except yellow, cyan, green and white sections must be superimposed (get white).

Note: Perform Y-level adjustment first.

Adjustment method:

1) Set adjustment address 29 with the adjustment remote controller.
2) Press the MEMORY button (S657 on the CK-19P board).
3) Confirm that all areas except yellow, cyan, green and white sections get white.
4) In case the condition in step 3) is not achieved, change adjustment data with the adjustment remote controller and repeat steps 2) and 3).
5) Change the adjustment address to store the adjustment data in the memory.

Shaded area must white

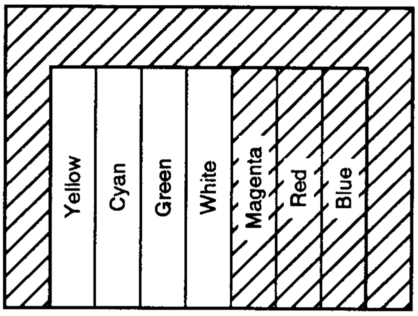


Fig. 7-41.

7-3-3. Title Pedestal Adjustment (CV-9 Board)

Subject	All-black (cover lens with black cap)
Measurement Point	Pin (B8) (VIDEO OUT) of the check point array or video output terminal
Measuring Instrument	Oscilloscope
Adjustment Address	03 (PED)
Specified Value	Minimum 4.43 MHz chroma component

Adjustment method:

1) Put a black cap on the lens and press the MEMORY button (S657 on the CK-19P board).
2) Turn the data screen on with the DATA SCREEN button (S509 on the VK-3P board) and confirm that the letters "T WHT" are displayed on the monitor screen (if the indication differs, press the COLOR button (S656 on the CK-19P board) and set it to "T WHT").
3) Set the adjustment address 03 with the adjustment remote controller.
4) Change adjustment data with the adjustment remote controller so as to minimize the 4.43 MHz chroma component.
5) Change the adjustment address to store the adjustment data in the memory.

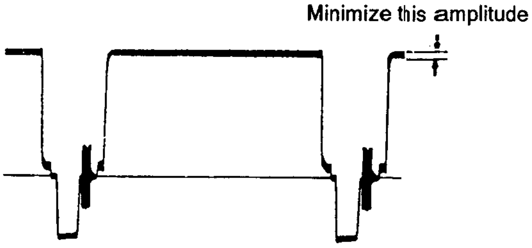


Fig. 7-42.

7-3-4. Title Y-level Adjustment (CV-9 Board)

Subject	All-black (over lens with black cap)
Measurement Point	Pin ⒷⒺ B8 (VIDEO OUT)of the check point array
Measuring Instrument	Oscilloscope
Adjustment Address	24 (CHARACTER)
Specified Value	270 ± 40 mV

Adjustment method:

1) Put a black cap on the lens and press the MEMORY button (S657 on the CK-19P board).
2) Turn the data screen on with the DATA SCREEN button (S509 on the VK-3P board) and confirm that the letters "T WHT" are displayed on the monitor.
3) Set the adjustment address 24 with the adjustment remote controller.
4) Change adjustment data with the adjustment remote controller so that Y-signal level becomes 270 ± 40 mV.
5) Change the adjustment address to store the adjustment data in the memory.

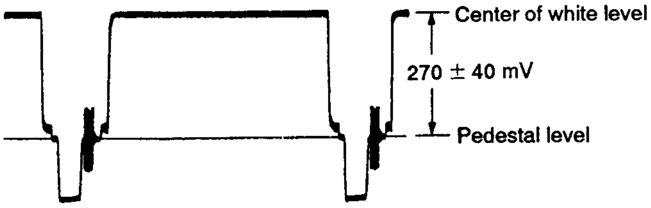

Center of white level
270 ± 40 mV
Pedestal level

Fig. 7-43.

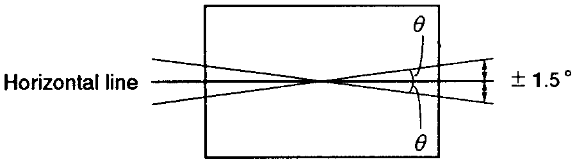
7-4. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT(TYPE A) (VF-14P BOARD)

7-4-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-44.

Adjustment method:

1) By turning RV904 (BRIGHT), adjust for a luminance level which provides appropriate visibility of the CRT screen.
2) Loosen the DY (deflection yoke) tightening nut.
3) Make the image horizontal by rotating DY.
4) Retighten the DY tightening nut. (Do not tighten excessively.)


θ
Horizontal line
± 1.5°
θ

Specified value: Image orientation within ± 1.5° of horizontal line.

Fig. 7-44.

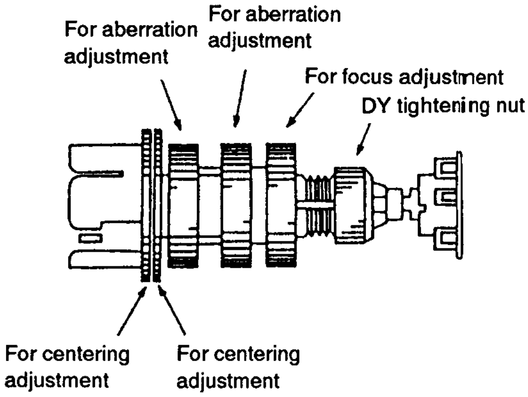

For aberration adjustment
For aberration adjustment
For focus adjustment
DY tightening nut
For centering adjustment
For centering adjustment

Fig. 7-45.

7-4-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-46.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-45.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360 ° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

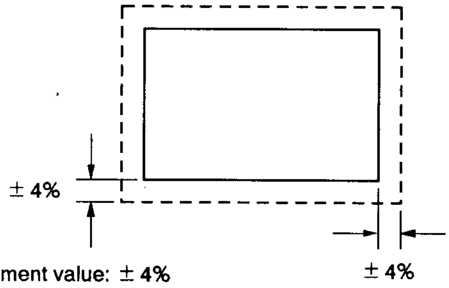


Fig. 7-46.

7-4-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion

Adjustment method:

1) Adjust for optimum focus using the focus ring. (See Fig. 7-45.)

7-4-4. Aberration Adjustment

Mode	E-E
Signal	Dot pattern
Specified Value	See Fig. 7-47.

Adjustment method:

1) Use the aberration adjustment rings to adjust any trailing dots to within 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
2) If off center, repeat the Centering Adjustment.

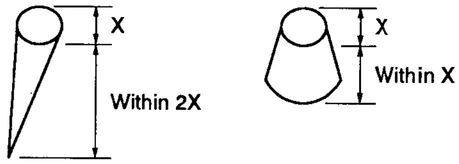


Fig. 7-47.

7-4-5. Horizontal Oscillation Frequency Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP)
Measurement Point	Positive terminal of C904
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV901
Specified Value	2.60 ± 0.05 Vdc

Adjustment method:

1) Adjust to 2.60 ± 0.05 Vdc using RV901.

7-4-6. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	C911
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV902.
2) Rotate RV904 to set the brightness to the normal level.
3) Short or open the pattern (A) of the H size adjustment capacitor (C911) to provide horizontal overscans of 6 ± 3% (total of left and right).
(See Fig. 7-49.)

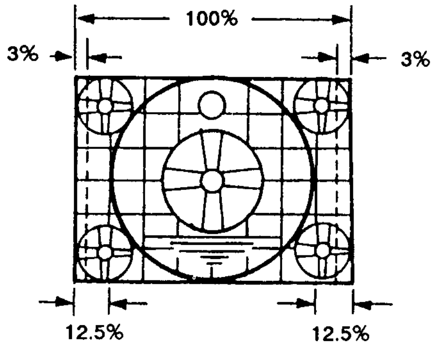
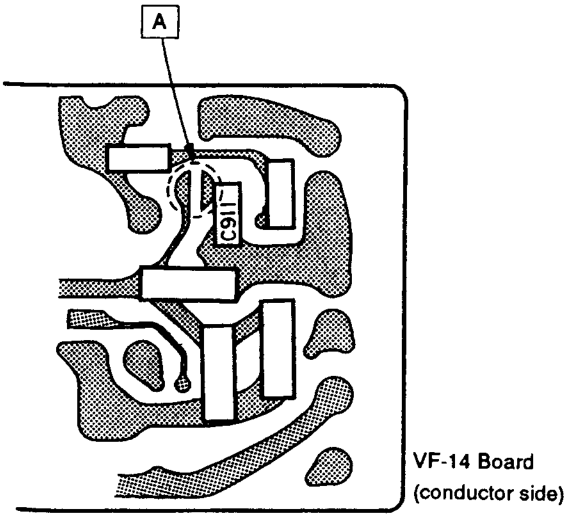


Fig. 7-48.



A section	H size
Open	Large
Short	Small

Fig. 7-49.

7-4-7. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV902
Specified Value	5 ± 3%

Adjustment method:

1) By turning RV902, adjust vertical overscan to 5 ± 3% (upper and lower total).

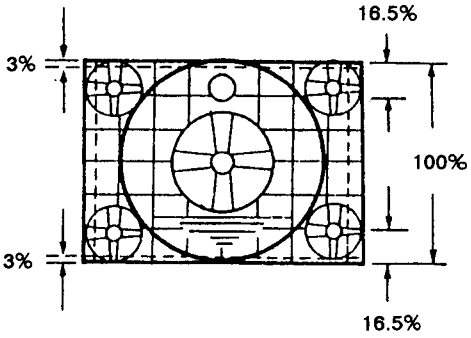


Fig. 7-50.

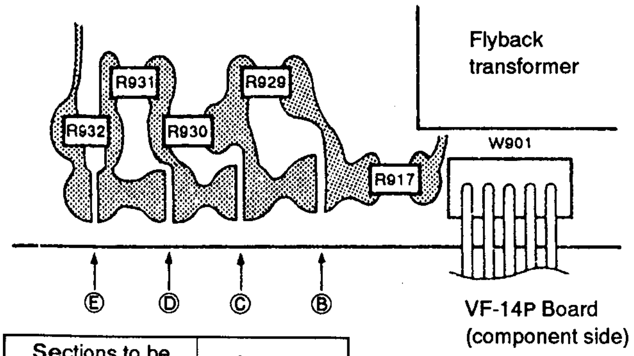
7-4-8. Brightness, Contrast Adjustments

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Brightness: RV904 Contrast: see Fig. 7-51.

Adjustment method:

1) Perform brightness and contrast adjustments alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

Use sections Ⓑ to Ⓔ of VF-14P board to open and short for contrast adjustment.



Sections to be shorted	Contrast
Ⓓ and Ⓔ	High
Ⓔ	↑
Ⓓ	
All open	
Ⓒ	
Ⓑ	↓
Ⓑ and Ⓒ	Low

Fig. 7-51.

7-4-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

Values should conform to specifications given in 7-4-6. Horizontal Amplitude Adjustment and 7-4-7. Vertical Amplitude Adjustment. If not, readjust accordingly, and repeat 7-4-8. Brightness, Contrast Adjustments. In this case, focus needs to be checked. If the image is not clear, perform 7-4-3. Focus Adjustment and 7-4-4. Aberration Adjustment.

7-5. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (TYPE B) (VF-22P BOARD)

7-5-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-53.

Adjustment method:

1) Adjust the volume array Ⓓ (BRIGHT) for appropriate brightness on CRT screen. (See Fig. 7-54.)
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-52.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

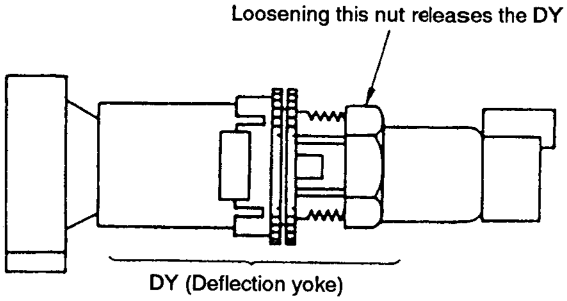
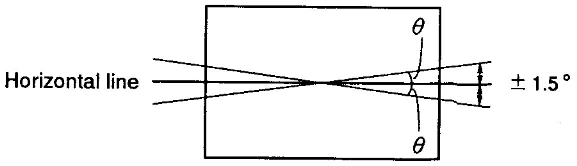
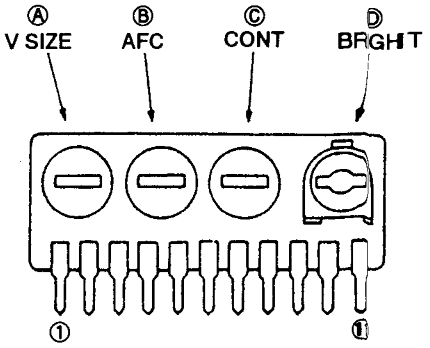


Fig. 7-52.



Specified value: Image orientation within ± 1.5° of horizontal line.

Fig. 7-53.



Volume array (CP901)

Fig. 7-54.

7-5-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-56.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-55.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360 ° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

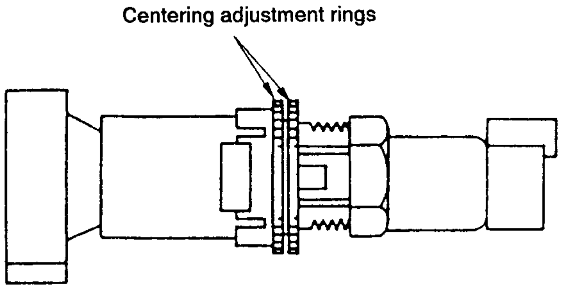


Fig. 7-55.

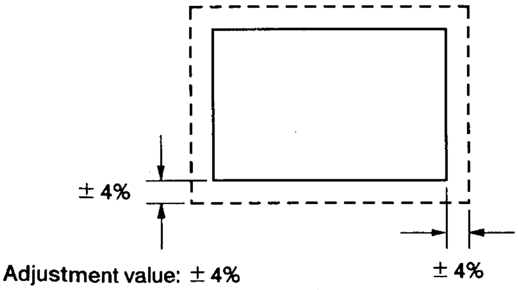


Fig. 7-56.

7-5-3. AFC Adjustment

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C915 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	Volume array Ⓑ (AFC)
Specified Value	2.6 ± 0.2 Vdc

Adjustment method:

1) Adjust volume array Ⓑ (AFC) for 2.6 ± 0.2 Vdc. (See Fig. 7-54.)

7-5-4. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	C905
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating volume array Ⓐ (V SIZE). (See Fig. 7-54.)
2) Rotate volume array Ⓓ (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern A of the H size adjustment capacitor (C905) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-58.)

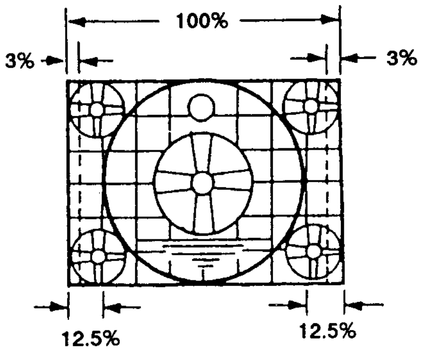
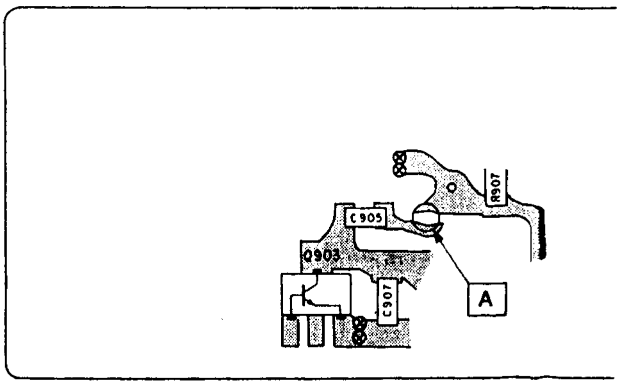


Fig. 7-57.



VF-22P board (conductor side)

A section	H size
Open	Large
Short	Small

Fig. 7-58.

7-5-5. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Volume array Ⓐ (V SIZE)
Specified Value	5 ± 3%

Adjustment method:

1) By turning volume array Ⓐ (V SIZE), adjust vertical overscan to 5 ± 3% (upper and lower total). (See Fig. 7-54.)

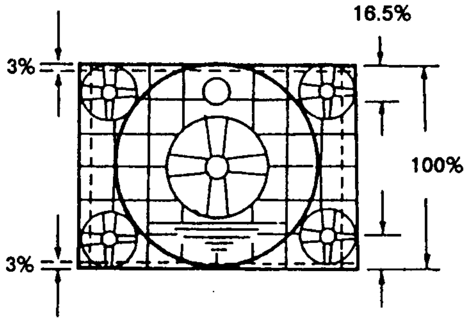


Fig. 7-59.

7-5-6. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV901

Adjustment method:

1) Adjust to the best focus point with RV901.

7-5-7. Brightness, Contrast Adjustments

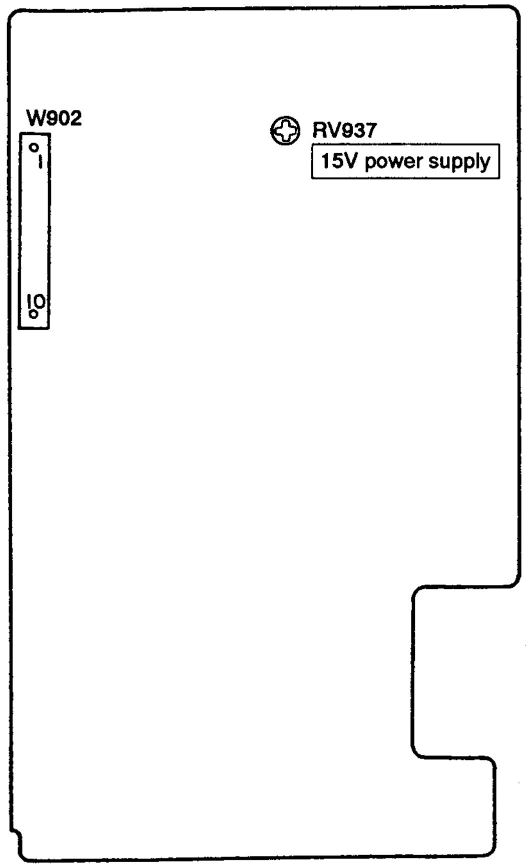
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Brightness: Volume array Ⓓ (BRIGHT) Contrast: Volume array Ⓒ (CONT)

Adjustment method:

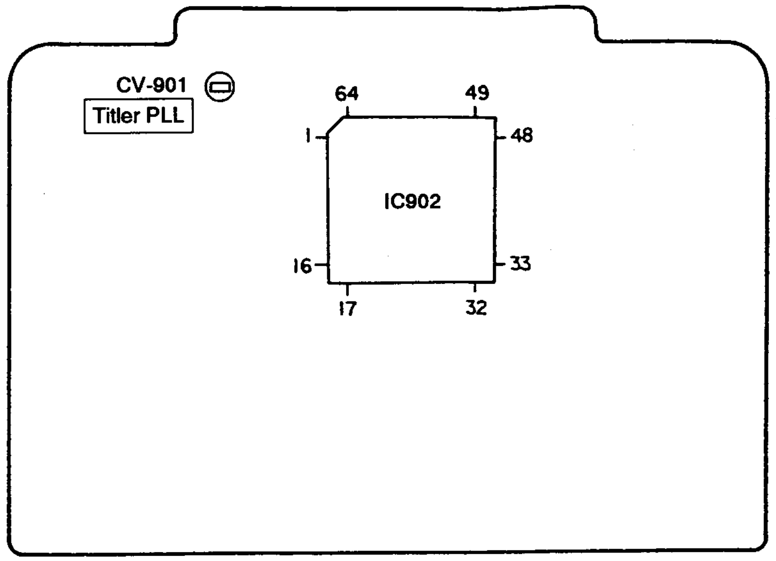
1) Adjust volume array Ⓓ (BRIGHT) and Ⓒ (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.) (See Fig. 7-54.)

7-6. ADJUSTMENT ELEMENTS LOCATION

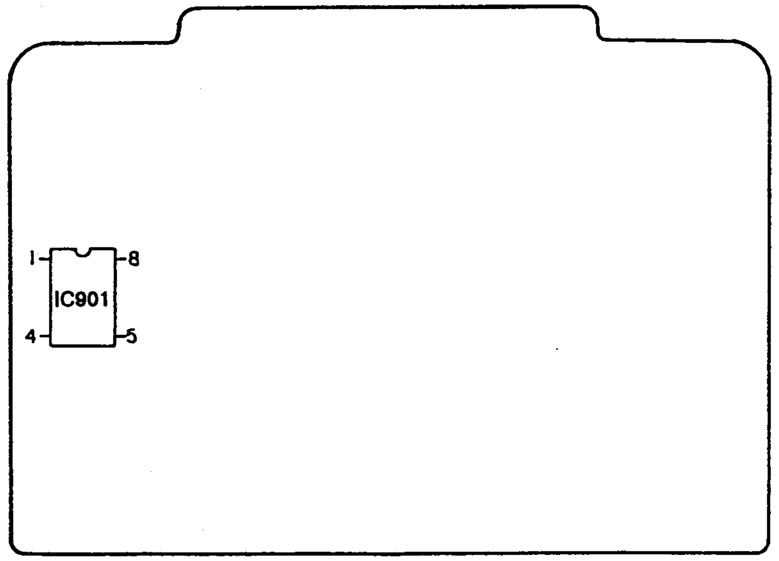
PS-225P BOARD (COMPONENT SIDE)


W902
1
10
RV937
15V power supply

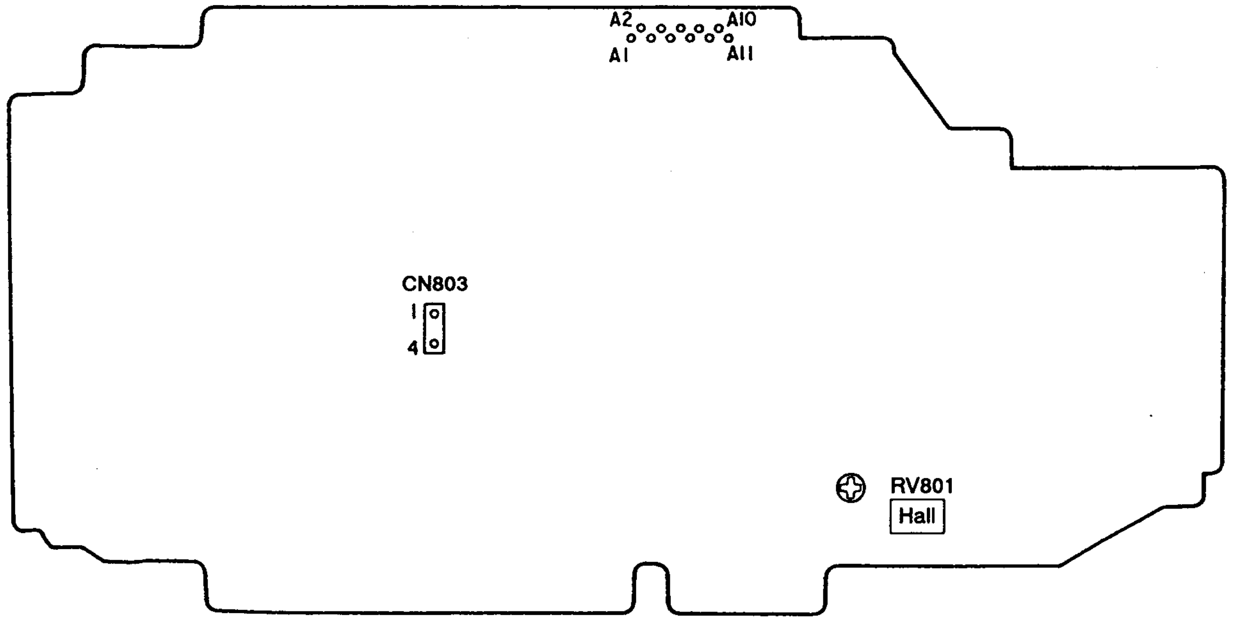
LI-10 BOARD (COMPONENT SIDE)


CV-901
Titler PLL
64
49
1
48
IC902
16
33
17
32

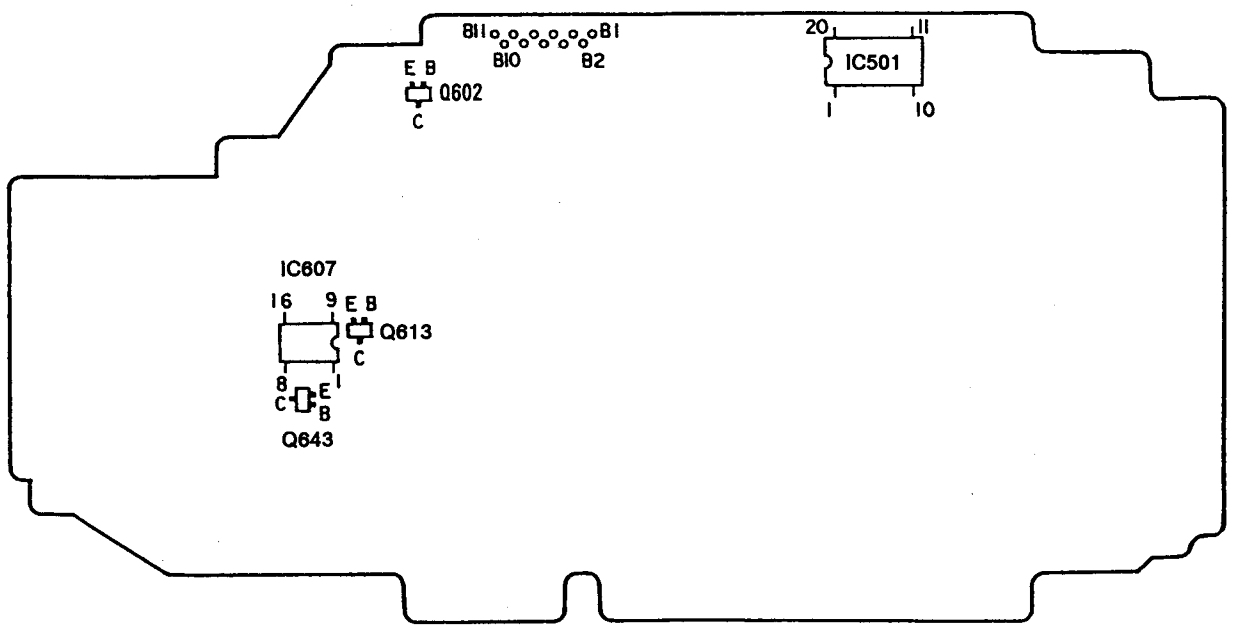
LI-10 BOARD (CONDUCTOR SIDE)



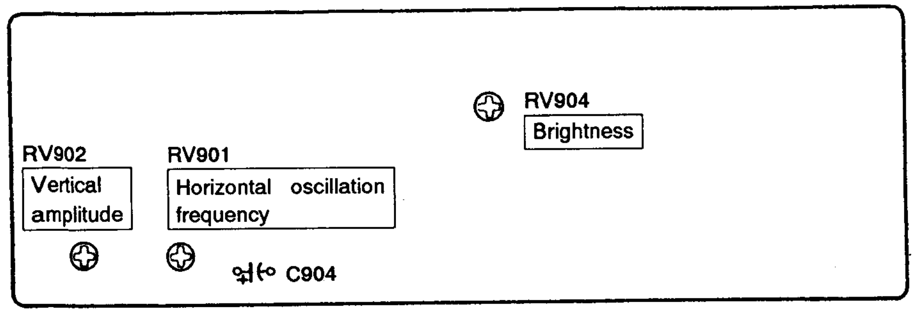
CV-9 BOARD (COMPONENT SIDE)


A2
A10
A1
A11
CN803
1
4
RV801
Hall

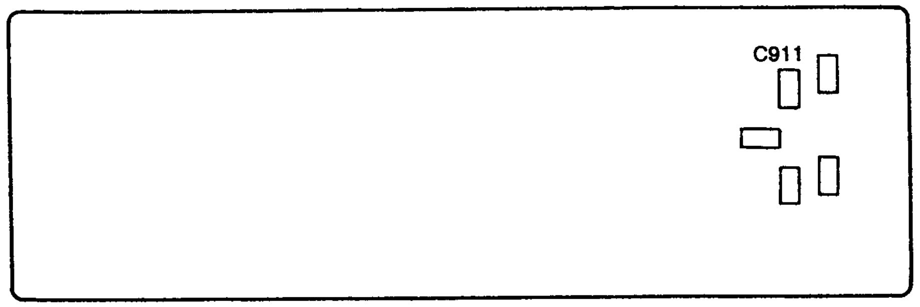
CV-9 BOARD (CONDUCTOR SIDE)


B11
B1
B10
B2
E B
Q602
C
20
11
IC501
1
10
IC607
16
9
E B
Q613
C
8
1
C
E
B
Q643

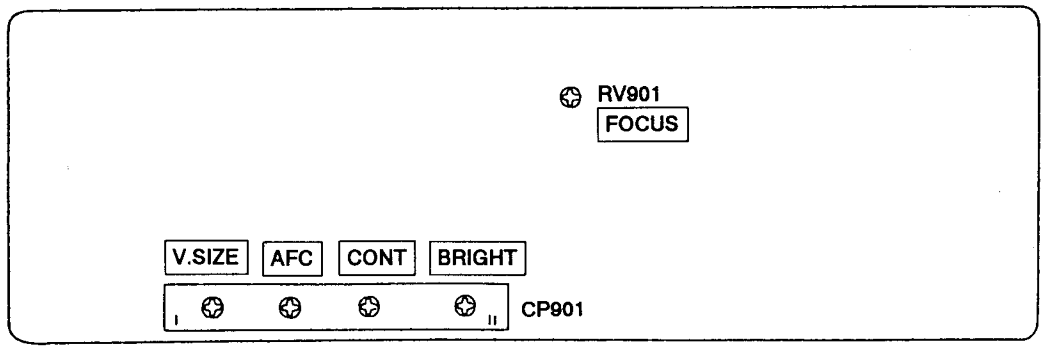
VF-14P BOARD (COMPONENT SIDE)


RV904
Brightness
RV902
Vertical amplitude
RV901
Horizontal oscillation frequency
C904

VF-14P BOARD (CONDUCTOR SIDE)



VF-22P BOARD (COMPONENT SIDE)


RV901
FOCUS
V.SIZE
AFC
CONT
BRIGHT
CP901

SECTION 8
MECHANISM BLOCK ADJUSTMENTS

Mechanism Block Adjustments

Refer to the separate "8mm Video Mechanical Adjustment Manual Ⅲ U Mechanism" for adjustment and checking of the mechanism block and for replacement of mechanical parts.
Refer to the following for setting of track shift mode.

8-1. TRACK SHIFT MODE SETTING

[Setting method]

- Connect the TEST A terminal and TEST B terminal to the COM terminal. Connect Pin ① and Pin ③ of CN508 on the VK-3P board to Pin ②. (See Fig. 8-1.)

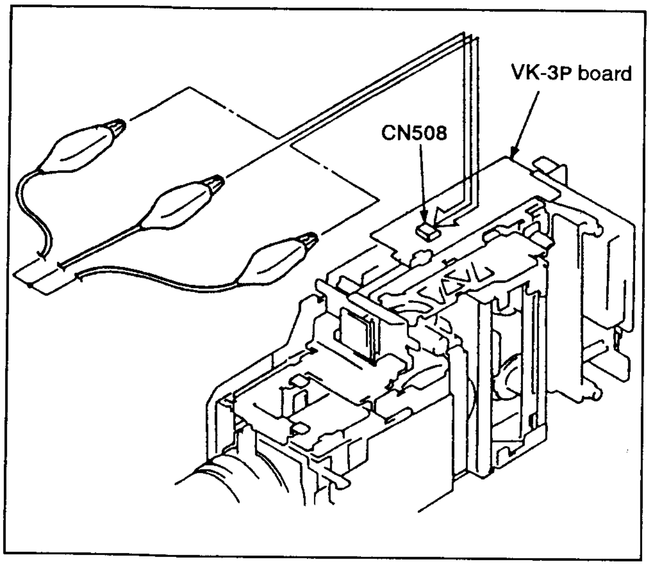

VK-3P board
CN508

Fig. 8-1.

8-2. PREPARATION FOR ADJUSTMENT

1) Perform cleaning of the tape running surface (tape guides, drums, capstan shafts, and pinch rollers).
2) Connection of oscilloscope
   CH 1: RF signal output (V RF OUT) of drum head
   Pin ③ (V RF OUT) of CN102 on the CO-2P board
   External trigger: External trigger output (RF SW.P)
   Pin ④ of CN102 on the CO-2P board.
3) Play back the alignment tape (WR5-1C, Ref No. J-5) for tracking.
4) Confirm that the RF waveform on oscilloscope at both entrance and exit sides is flat. (See Fig. 8-3.)
   Perform the adjustment described below if not flat.

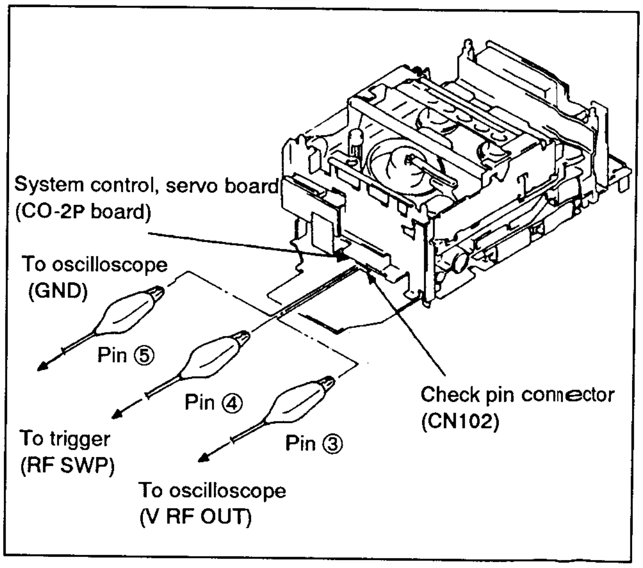

System control, servo board
(CO-2P board)
To oscilloscope
(GND)
Pin ⑤
Pin ④
To trigger
(RF SWP)
Pin ③
To oscilloscope
(V RF OUT)
Check pin connector
(CN102)

Fig. 8-2.

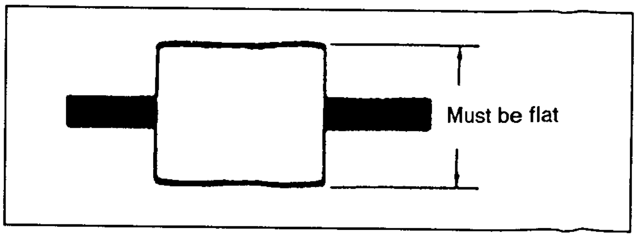

Must be flat

Fig. 8-3.

SECTION 9
VIDEO BLOCK ADJUSTMENTS

During the adjustments, see the adjustment element location to the adjustment from page 268.

Use the following measuring instruments for adjustment of the VTR block.

[Equipment to be used]

1) Monitor TV
2) Dual trace oscilloscope of over 10 MHz band, incorporates delay mode. (Use 10 : 1 probe unless otherwise specified)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Regulated power supply
11) Alignment tapes
    Tracking adjustment (WR5-1CP)*[1]
        Parts Code: 8-967-995-07
    Video frequency characteristics adjustment (WR5-6C)*[2]
        Parts Code: 8-967-995-17
    Operation check (WR5-4CL)*[3]
        Parts Code: 8-967-995-56
        (WR5-5CSP)*[4]
        Parts Code: 8-967-995-47
    Note:
    *1 WR5-1C (8-967-995-06) is also available.
    *2 WR5-2C (8-967-995-16) is also available.
    *3 WR5-3CL (8-967-995-36) is also available.
    *4 WR5-3CSP (8-967-995-27) and WR5-4CSP (8-967-995-46) are also available.
12) Adjustment remote controller (J-6082-053-A)

[Connection of equipment]

Unless otherwise specified, adjustment is made with the measuring instrument connected as shown in the diagram below.

- Camera/video power switch......Video position

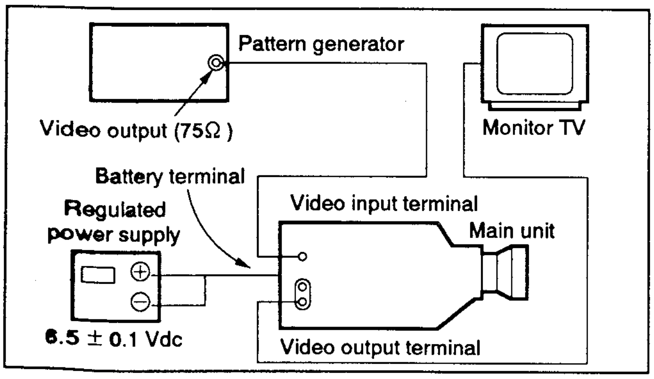
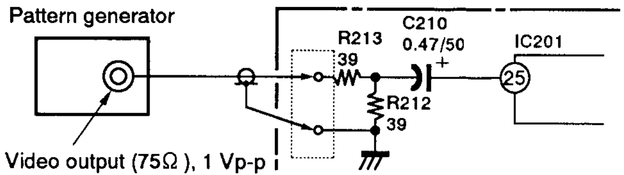

Pattern generator
Video output (75Ω)
Monitor TV
Battery terminal
Regulated power supply
Video input terminal
Main unit
6.5 ± 0.1 Vdc
Video output terminal

Fig. 9-1.

Note: When adjusting with the CV-9 board open, remove the follwing connectors:
1. CN601, CN602, CN801
2. CN802
3. CN901
4. CN902

There is not the external input terminal (VIDEO IN) in AEP, UK models. Accordingly, perform the following operation.

- Signal input


Pattern generator
C210
R213
0.47/50
IC201
39
25
R212
39
Video output (75Ω), 1 Vp-p
J202 pattern
CV-9 BOARD

Note: Mount R212, R213 and C210.

- REC mode
  1. Connect Pins ① and ⑦ of the VK-3P board with a diode (1SS119, etc.) until the unit enters the REC mode.

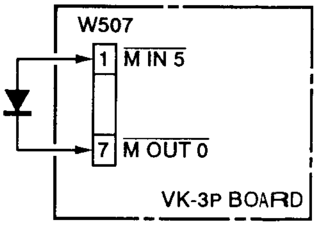

W507
1
M IN 5
7
M OUT 0
VK-3P BOARD

Fig. 9-2.

[Set-up during adjustment]

Since the video output signal obtained from the pattern generator is used as the adjusting signal for the VTR block, it is necessary that this video output signal be within the required specifications. Connect an oscilloscope to J202 (video input terminal) on the CV-9 board and make sure that the amplitude of the video SYNC signal is approximately 0.3V, that the video block amplitude is approximately 0.7V, that the burst signal amplitude is approximately 0.3V with flat characteristics, and the signal level ratio between the burst signal and "Red" signal is 0.30 : 0.66. The video signal (color bars) used for VTR block electrical adjustment are shown in Fig. 9-3.

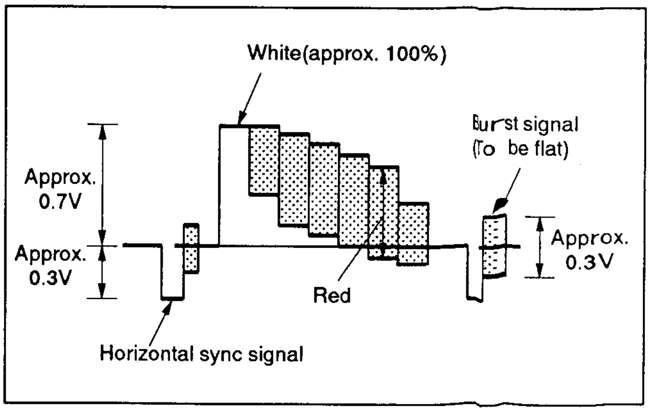
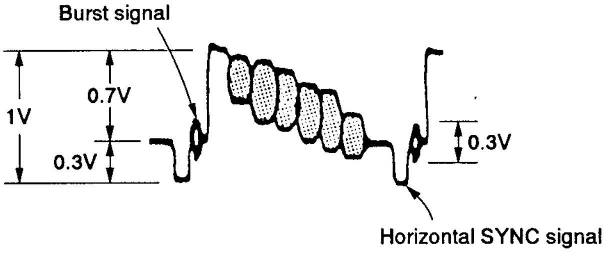
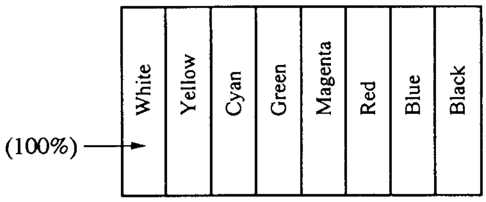


Fig. 9-3. Color bar signal of pattern generator

[Alignment tapes]

Tape	Content	Use
Tracking (WR5-1CP)	1. Recording area: PCM – video 2. Recording content: CH2:1MHz linearity adjustment signal (CH1: 9MHz)	Drum linearity adjustment
Video Frequency Response (WR5-6C)	1. Recording area: Video 2. Recording content: RF sweep 0 to 10MHz 3. Maker: 1, 3.58, 5.5 and 7MHz	Frequency response adjustment
Operation Check SP mode (WR5-5CSP) LP mode (WR5-4CL) Note: PCM area is not included in WR5-4CL	1. Recording area: Video 2. Recording content: ■ Video track •Video signals Color bars 4 minutes Monoscope 4 minutes (Color bars)  Burst signal 1V 0.7V 0.3V 0.3V Horizontal SYNC signal  White Yellow Cyan Green Magenta Red Blue Black (100%) •Audio signals(AFM) 400Hz 60% modulation ■ PCM area •Audio signals(PCM) 1kHz 4 minutes Color bar 20Hz 2sec 400Hz 4sec } Iterative Monoscope 14kHz 2sec	Operation check

E, Australian model

[I/O level and impedance]

Video input	Pin jack Input signal: 1 Vp-p, 75Ω unbalanced, negative sync
Video output	Pin jack Output signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio input	Pin jack Input level: –7.5 dBs (0 dBs=0.775 Vrms) Input impedance: More than 47 kΩ
Audio output	Pin jack Specified output: –7.5 dBs Output impedance: More than 2.2 kΩ

AEP, UK model

[Output level and impedance]

Video output	Pin jack Output signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio output	Pin jack Specified output: –7.5 dBs Output impedance: More than 2.2 kΩ

[Service modes]

This unit is equipped with service modes for adjustment and operation checking.

There are the following two service modes and switching between them is by connection between GND and Pin (B6) of the check point array on the CV-9 board.

Service Mode	Function	Connection between GND and Pin (B6) of the check point array (CV-9 board)
Status indication mode	For video block adjustment, operation checking	Open (no connection)
EVR adjustment mode	For adjustment of camera block	Shorted

Refer to Camera Block Adjustment for details on the EVR adjustment mode.

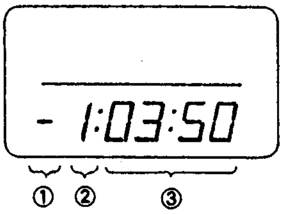
1. Invoking service mode

1) Connect the adjustment remote controller to the remote terminal (J951 on RC-29P board) of the main unit.
2) Set the HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).

The status indication mode is invoked by the above operation. (To select the EVR adjustment mode, connection between Pin (B6) of the check point array and GND is required.)

2. Indication on adjustment remote controller LCD in status indication mode

Note: In categories 1 through 4, the same information is displayed in the EVF screen and on the monitor screen (when the data screen is ON).



①...... Minus segment flashes to indicate that the service mode has been invoked.

②...... Indicates service mode category.

③...... Indicates battery voltage, LAST EMG, PRESET EMG, or MODE SW CODE according to current category.

3. Category selection and indication in each category

Select the desired category with the FF or REW button of the adjustment remote controller. There are four categories (1 through 4) and the indications are different for each. (Note that category 0 is the EVR adjustment mode.)

<table>
<tr><th>Caategory</th><th>Indication on LCD</th></tr>
<tr><td>1</td><td>A/D conversion value for battery voltage (decimal indication)*1
00 : 00 – 02 : 55</td></tr>
<tr><td>2</td><td>LAST EMG (last emergency)*2
Refer to Service Mode Error Indications.</td></tr>
<tr><td>3</td><td>PRESENT EMG (current emergency)*3
Refer to Service Mode Error Indications.</td></tr>
<tr><td>4</td><td>MODE SW CODE (mechanism status)
<table>
<tr><td>00 : 00</td><td>EJECT</td></tr>
<tr><td>00 : 01</td><td>I.A</td></tr>
<tr><td>00 : 02</td><td>UNLOAD</td></tr>
<tr><td>00 : 03</td><td>I.B</td></tr>
<tr><td>00 : 04</td><td>STOP (threading completed)</td></tr>
<tr><td>00 : 05</td><td>I.C</td></tr>
<tr><td>00 : 06</td><td>RP(REC, PB, FF, REW, CUE, REVIEW, PAUSE)</td></tr>
<tr><td>00 : AA</td><td>Mode switch error</td></tr>
</table></td></tr>
</table>

Notes: 1) Indicates a value proportional to the battery voltage.
2) LAST EMG indicates the error occurring last before entering service mode. Even if an error occurs in the service mode, it is not indicated.
3) PRESENT EMG indicates the status when the FF or REW button of the adjustment remote controller was pressed. So, the indication does not change even if the error is eliminated.

- **Service mode error indication**

Error Status	PRESENT EMG Indication LAST EMG	Indication
No error	00 : 00	00 : 00
Loading motor	00 : 01	00 : 01
REEL FG error during unthreading	00 : 02	00 : 02
REEL FG error not during unthreading	00 : 03	00 : 03
Capstan error	00 : 04	00 : 04
DRUM PG error (0) when starting drum	00 : 05	00 : 05
DRUM PG error (1) when starting drum	01 : 05	00 : 14 or 00 : 0E
DRUM PG error (2) when starting drum	02 : 05	00 : 15 or 00 : 0F
No DRUM PG (0) when starting drum	00 : 06	00 : 06
No DRUM PG (1) when starting drum	01 : 06	00 : 14 or 00 : 0E
No DRUM PG (2) when starting drum	02 : 06	00 : 15 or 00 : 0F
DRUM FG error (0) when drum stationary	00 : 07	00 : 07
DRUM FG error (1) when drum stationary	01 : 07	00 : 14 or 00 : 0E
DRUM FG error (2) when drum stationary	02 : 07	00 : 15 or 00 : 0F
No DRUM PG (0) when drum stationary	00 : 08	00 : 08
No DRUM PG (1) when drum stationary	01 : 08	00 : 14 or 00 : 0E
No DRUM PG (2) when drum stationary	02 : 08	00 : 15 or 00 : 0F
Phase error (0) when drum stationary	00 : 09	00 : 09

(1) During tape threading
(2) During tape unthreading
(0) Other

4. Releasing service mode

The service mode is released by returning the HOLD switch of the adjustment remote controller to the NORMAL position or by disconnecting the adjustment remote controller from the remote terminal.

[Test modes]

This unit has three test modes which are invoked by connecting the terminals of CN508 on the VK-3P board.

Test Mode	Connection of CN508 on VK-3P Board	Function
1	Pin ③ (TEST A) and Pin ② (GND) short-circuited	1. Switching position adjustment possible. 2. Error detection disabled.
2	Pin ① (TEST B) and Pin ② (GND) short-circuited	1. For battery end detection adjustment BATTERY SENSE voltage (input voltage to Pin ㊽ of IC501) is displayed in EVF and monitor screen (only when data screen is ON). $\underbrace{-1}_{\text{Mode indication}} : \underbrace{03 : 05}_{\text{BATTERY SENSE voltage}}$
3	Pin ③ (TEST A) and Pin ② (GND)/Pin ① (TEST B) and Pin ② short-circuited.	1. For tape path adjustment (Tracking shifted by 1/4 track) Refer to MECHANISM ADJUSTMENTS.

9-1. POWER SUPPLY ADJUSTMENTS AND CHECKS

9-1-1. Oscillation Frequency Adjustment (PS-225P Board)

Mode	Stop (POWER ON)
Measurement Point	Collector of Q941
Measuring Instrument	Frequency counter
Adjustment Element	RV938
Specified Value	475 ± 5 kHz

Adjustment method:

1) Adjust the oscillation frequency to 475 ± 5 kHz with RV938.

9-1-2. Video 5V Adjustment (PS-225P Board)

Mode	Stop (POWER ON)
Measurement Point	Pin ① of W901
Measuring Instrument	Digital voltmeter
Adjustment Element	RV936
Specified Value	5.0 ± 0.05 Vdc

Adjustment method:

1) Adjust with RV936 so that it becomes 5.0 ± 0.05 Vdc.

9-2. SYSTEM CONTROL ADJUSTMENTS

9-2-1. Battery Down Adjustment (CO-2P Board)

Mode	Camera recording
Signal	Arbitrary
Measurement Point	Confirmation on monitor screen
Measuring Instrument	
Adjustment Element	RV551
Specified Value	Battery indication (🔋) flashes at a rate of 3.8 times per second (3.8 Hz) and counter value is approximately "–1 : 02 : 85".

Connections:

1) Connect a regulated power supply and digital voltmeter as shown in Fig. 9-4.
2) Connect Pin ① (TEST B) and Pin ② (GND) of CN508 on the VK-3P board with a jumper wire. (Test 2 mode)

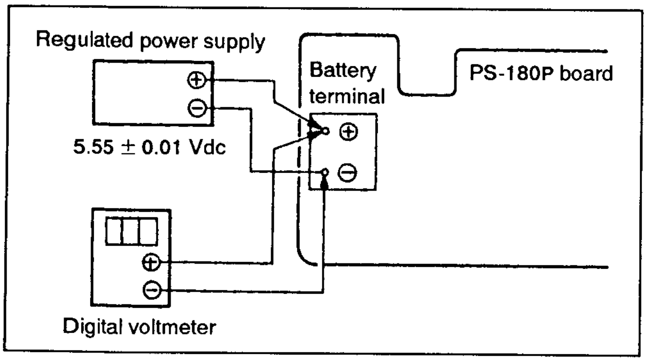


Fig. 9-4.

Adjustment method:

1) Press the data screen button (S509) on the VK-3P board to display the counter on the monitor screen. (See Fig. 9-5.)
2) Confirm that the indication on the digital voltmeter is 5.55 ± 0.01 Vdc.
3) Slowly rotate RV551 and set to the closest point at which the battery indication (🔋) on the monitor screen flashes at a rate of 3.2 times per seconds (3.2 Hz) and the counter value is "–1 : 02 : 85".

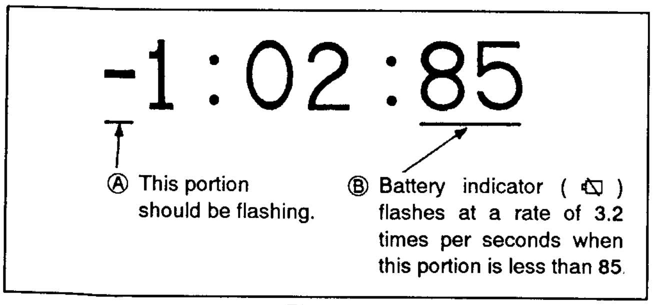

-1 : 02 : 85
Ⓐ This portion should be flashing.
Ⓑ Battery indicator (🔋) flashes at a rate of 3.2 times per seconds when this portion is less than 85.

Fig. 9-5.

Checking method:

Perform the following checks and repeat the adjustments again if the required conditions are not satisfied.

1) Adjust the output voltage of the regulated power supply so that the indication of the digital voltmeter becomes 6.30 ± 0.01 Vdc.
2) Set the unit to the camera REC mode after turning the power off and then on.
3) Press the data screen button on the VK-3P board so that there is data indication on the monitor screen.
4) Slowly lower the output voltage of the regulated power supply until the indication on the digital voltmeter becomes 5.60 ± 0.01 Vdc.
5) Confirm that the battery indicator (🔋) on the monitor screen is out or flashing at a rate of 0.8 times per second.
6) Slowly lower the output voltage of the regulated power supply until the indication on the digital voltmeter becomes 5.50 ± 0.01 Vdc.
7) Confirm that the battery indicator (🔋) is flashing on the monitor screen at a rate of 3.2 times per second (3.2 Hz).

9-2-2. System Clock Adjustment (CK-19P Board)

Mode	Power ON
Measurement Point	Pin ⑱ of IC651
Measuring Instrument	Frequency counter
Adjustment Element	RV651
Specified Value	330 ± 5 kHz

Adjustment method:

1) Adjust with RV651 so that it becomes 330 ±5 kHz.

9-2-3. Clock Precision Adjustment (CK-19P Board)

Mode	Power OFF
Measurement Point	Pin ㊶ of IC651
Measuring Instrument	Frequency Counter
Adjustment Element	CV651
Specified Value	8192.00 ± 0.04 Hz

Adjustment method:

1) Disconnect the main power supply and lithium battery.
2) Connect Pin ㉘ (TEST) of IC651 to ground using a jumper wire (TEST mode).
3) Supply 3V (3.0 ± 0.05 Vdc) of power to the lithium battery terminals from a regulated power supply.
4) Adjust to 8192.00 ± 0.04 Hz using CV651.
5) Disconnect the regulated power supply and the jumper wire.

9-3. SERVO SYSTEM ADJUSTMENTS

9-3-1. Oscillation Frequency Adjustment (CO-2P Board)

Mode	Recording (SP mode)
Signal	Color bar
Measurement Point	Pin ⑩ of IC621
Measuring Instrument	Frequency counter
Adjustment Element	RV621
Specified Value	480 ± 5 kHz

Adjustment method:

1) Set the oscillation frequency to 480 ± 5 kHz using RV621.

9-3-2. REC ATF Level Checking (CO-2P Board)

Mode	Recording
Signal	No signal
Measurement Point	Emitter of Q530
Measuring Instrument	Oscilloscope
Specified Value	Approx. 900 mVp-p

Checking method:

1) Confirm that the REC ATF signal level is approximately 900 mVp-p.

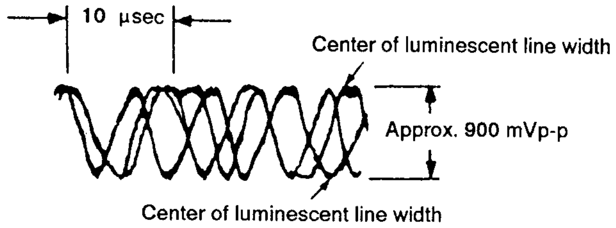

10 μsec
Center of luminescent line width
Approx. 900 mVp-p
Center of luminescent line width

Fig. 9-6. REC ATF level checking

9-3-3. Switching Position Adjustment (CO-2P Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	CH-1: J201 (video output) on CV-9 board CH-2: Pin ④ (RF SWP) of CN102
Measuring Instrument	Oscilloscope
Adjustment Element	RV501
Specified Value	6.5 ± 0.3H (410 ± 20 μs)

Connections:

1) Connect Pin ③ (TEST A) and Pin ② (GND) of CN508 on the VK-3P board using a jumper wire. (Test 1 mode)

Adjustment method:

1) Adjust with RV501 so that it becomes 6.5 ± 0.3H (410 ± 20 μs).

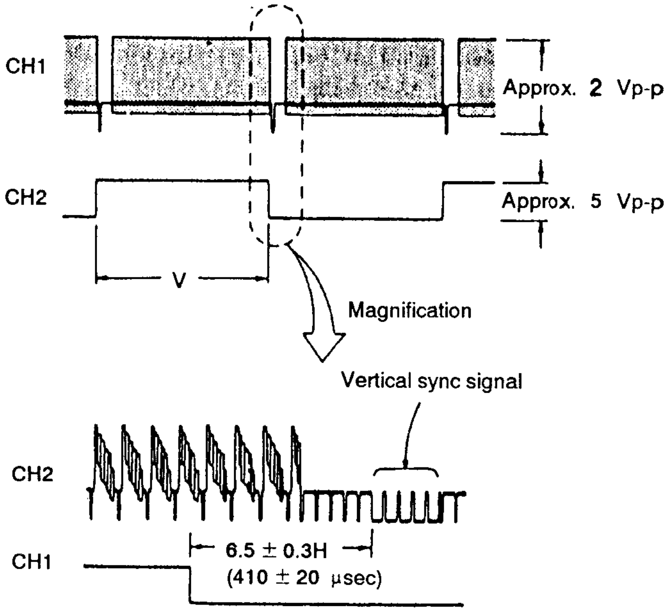

CH1
Approx. 2 Vp-p
CH2
Approx. 5 Vp-p
V
Magnification
Vertical sync signal
CH2
CH1
6.5 ± 0.3H
(410 ± 20 μsec)

Fig. 9-7. Switching position adjustment

9-3-4. Still Adjustment (CV-9 Board)

Mode	Playback pause (LP)
Signal	Self-recorded tape of color bars signal
Measurement Point	Monitor TV screen
Measuring Instrument	
Adjustment Element	RV552
Specified Value	Equal top and bottom noise bands

Note: Use the midsection of a tape (1/4 to 3/4) for adjustment.

Adjustment method:

1) Play back the self-recorded tape and press the PAUSE button to set the playback pause mode after the image has stabilized.
2) Confirm that the noise bands on top and bottom of the screen are eual.
3) If the specified condition is not satisfied, adjust RV552, and repeat 1) and 2).

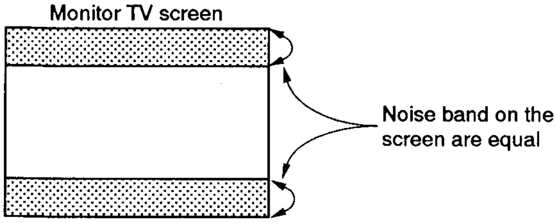


Fig. 9-8. Still adjustment

9-3-5. Capstan FG Adjustment (CO-2P Board)
(E, Australian Model only)

Mode	Recording (LP mode)
Signal	Arbitrary
Measurement Point	Pin ① of IC510
Measuring Instrument	Oscilloscope
Adjustment Element	RV502
Specified Value	Minimum amplitude

Adjusting method:

1) Adjust amplitude of the output waveform (capstan error) at Pin ① of IC510 to the minimum with RV502.

Minimize amplitude.

Fig. 9-9.

9-4. VIDEO BLOCK ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure outlined below.

The color video signal supplied from the pattern generator is utilized as the video input signal for video system adjustment in the recording mode. Make sure that the sync signal and color burst signal match the specifications given in set-up for adjustment, as shown in Fig. 9-3.

[Adjustment procedure]

1) Playback frequency characteristics adjustment
2) Flying erase check
3) Crystal oscillator fo adjustment
4) Y/C separation adjustment
5) IR2 adjustment
6) SYNC AGC adjustment
7) Emphasis input level adjustment
8) PB Y level adjustment
9) PB video out level adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis fo adjustment
13) REC Y level adjustment
14) REC C level adjustment
15) Feedback chroma adjustmrnt
16) Quasi burst phase adjustment
17) Delay burst phase adjustment
18) DDS character position adjustment
19) Character generator fo adjustment

9-4-1. Playback Frequency Characteristics Adjustment (CO-2P Board)

1. CH1, CH2 adjustment

The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristics adjustment (WR5-6C)
Measurement Point	Pin ③ of CN102 External trigger: Pin ④ of CN102 Trigger slope: +, [–]
Measuring Instrument	Oscilloscope
Adjustment Element	RV101 [RV102]
Specified Value	3.58 MHz level : 5.5 MHz level=4 : 3

Adjustment method:

1) Adjust RV101 [RV102] so that the ratio of the 3.58 MHz level to the 5.5 MHz level is 4 : 3 [4 : 3].

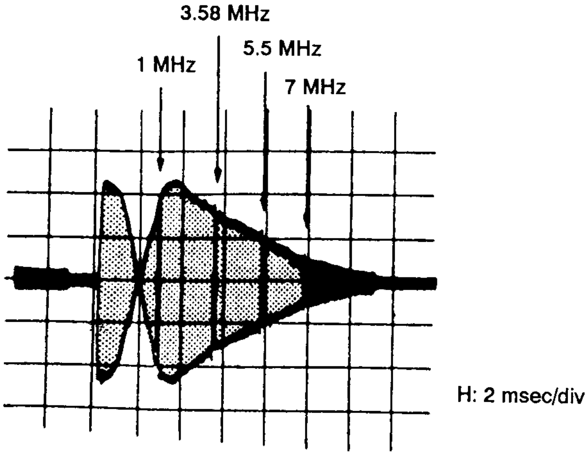


Fig. 9-10. Playback frequency characteristics adjustment

9-4-2. Flying Erase Check (CO-2P Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑫ of CN101 (TP103: FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: 7.95 ± 5.5 MHz Voltage: 7.75 ± 0.75 Vp-p

Note: Be sure to use MP type tape. (Pin ⑪ of CN501 should be "L".)

Checking method:

1) Confirm that the oscillation frequency is 7.95 ± 5.5 MHz and the oscillation voltage is 7.75 ± 0.75 Vp-p.

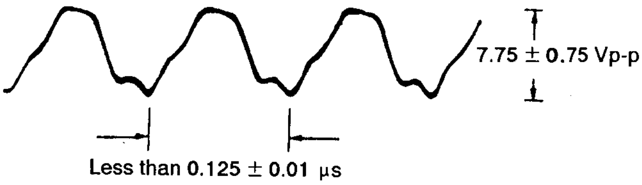


Fig. 9-11.

9-4-3. Crystal Oscillator fo Checking (CV-9 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	Pin ⑩ of W202 (fsc IN)
Measuring Instrument	Frequency counter
Specified Value	4433619 $^{+50}_{-60}$ Hz

Checking method:

1) Confirm that the oscillation frequency at Pin ⑩ of W202 is 4433619 $^{+50}_{-60}$ Hz.

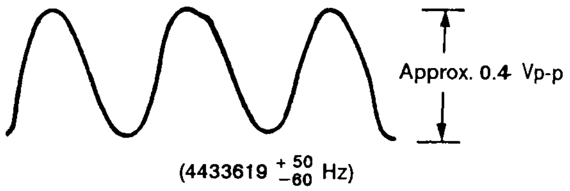


Fig. 9-12. Crystal oscillator fo adjustment

9-4-4. Y/C Separation Adjustment (CV-9 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Any terminal of RV204 (DEV) (Pin ㉕ of IC203)
Measuring Instrument	Oscilloscope
Adjustment Element	RV202
Specified Value	Minimum residual chroma component

Connections:

1) Connect Pin ㊴ of IC203 (Pin ⑭ of IC202) to GND with a 10 µF/16V electrolytic capacitor. (Capacitor negative side to GND)

Adjustment method:

1) Set the residual chroma component to minimum with RV202.

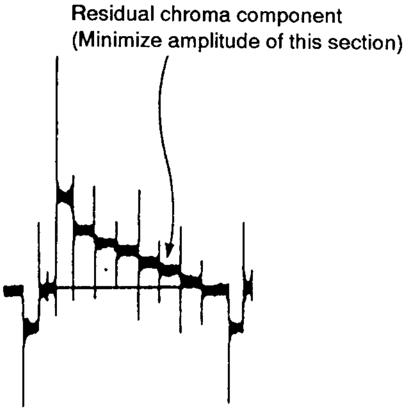

Residual chroma component
(Minimize amplitude of this section)

Fig. 9-13. Y/C separation adjustment

9-4-5. IR2 Adjustment (CV-9 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Pin ⑧ of IC203 or base of Q252 (BF OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV203
Specified Value	6.9 ± 0.2 µsec

Adjustment method:

1) Adjust RV203 so that it becomes 6.9 ± 0.2 µsec.

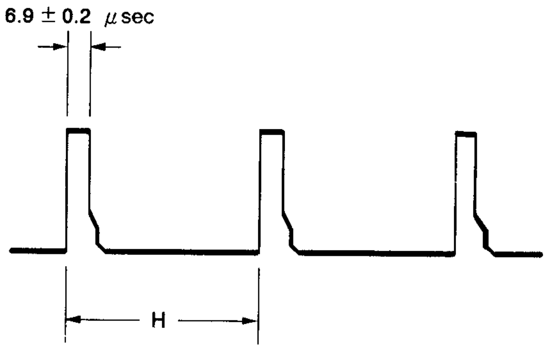


Fig. 9-14. IR2 adjustment

9-4-6. SYNC AGC Adjustment (CV-9 Board)

Mode	Recording
Signal	Color bar
Measurement Point	J201 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV201
Specified Value	1.00 ± 0.05 Vp-p

Note: Terminate VIDEO OUT (J201) at 75Ω .

Adjustment method:

1) Adjust with RV201 so that it becomes 1.00 ± 0.05 Vp-p.

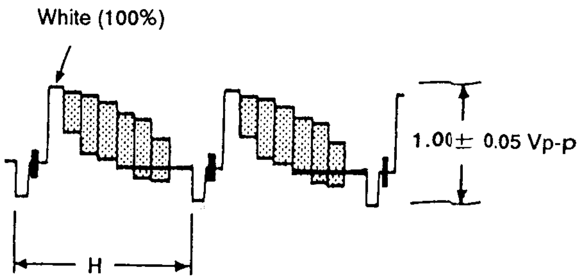


Fig. 9-15. SYNC AGC adjustment

9-4-7. Emphasis Input Level Adjustment (CV-9 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin (54) of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV401
Specified Value	0.50 ± 0.02 Vp-p

Adjustment method:

1) Adjust with RV401 so that it becomes 0.50 ± 0.02 Vp-p.

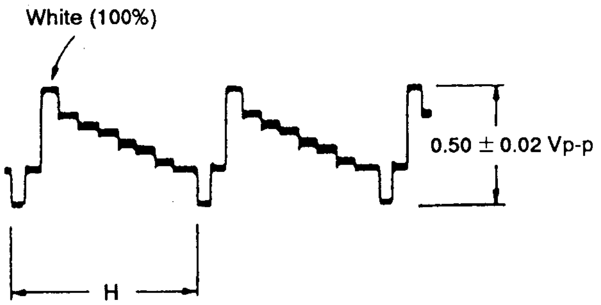


Fig. 9-16. Emphasis input level adjustment

9-4-8. PB Y Level Adjustment (CV-9 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP) Color bar section
Measurement Point	Pin ㊼ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV402
Specified Value	0.50 ± 0.02 Vp-p

Adjusting method:

1) Adjust to 0.50 ± 0.02 Vp-p with RV402.
2) Always perform "PB video out level adjustment" after this adjustment.

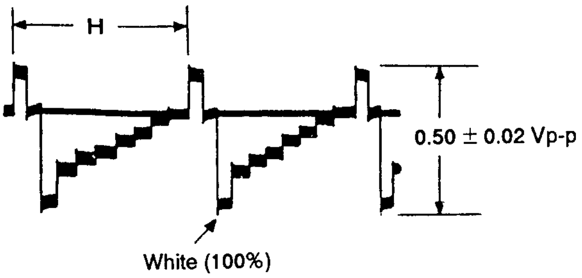


Fig. 8-17. PB Y level adjustment

9-4-9. PB Video Out Level Adjustment (CV-9 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP) Color bar section
Measurement Point	J201 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV403
Specified Value	1.00 ± 0.04 Vp-p

Note: Terminate VIDEO OUT (J201) at 75Ω .

Adjustment method:

1) Adjust with RV403 so that it becomes 1.00 ± 0.04 Vp-p.

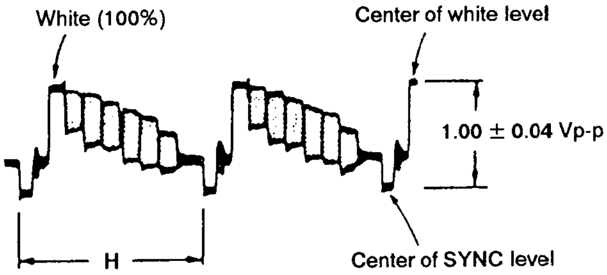


Fig. 9-18. PB video out level adjustment

9-4-10. Y FM Carrier Frequency Adjustment (CV-9 Board)

Mode	Recording
Signal	No signal
Measurement Point	Emitter of Q232 or center terminal of RV207 (REC Y)
Measuring Instrument	Frequency counter
Adjustment Element	RV205
Specified Value	4.39 ± 0.02 MHz

Adjustment method:

1) Adjust to 4.39 ± 0.02 MHz with RV205.
2) Perform "Deviation Adjustment".

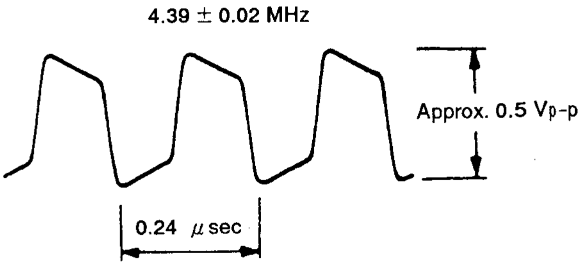


Fig. 9-19. Y FM carrier frequency adjustment

9-4-11. Y FM Deviation Adjustment (CV-9 Board)

Mode	Recording and playback
Signal	Color bar
Measurement Point	J201 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV204
Specified Value	Playback level is 1.00 ± 0.04 Vp-p

Notes: 1) Confirm that "PB Y Level Adjustment", "PB Video Out Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.
2) Terminate VIDEO OUT (J201) at 75Ω .

Adjustment method:
1) Record the color bar signal.
2) Playback the recorded signal.
3) Confirm the playback output.
Specified value: 1.00 ± 0.04 Vp-p
4) If the specified value is not satisfied, repeat 1) to 3) after turning RV204 in the following manner.

	Rotation direction of RV204
When smaller than specified value	Clockwise (↻)
When larger than specified value	Counterclockwise (↺)

Table 9-1.

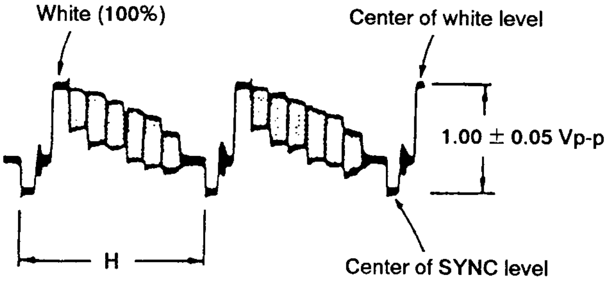

White (100%)
Center of white level
1.00 ± 0.05 Vp-p
H
Center of SYNC level

Fig. 9-20. Y FM deviation adjustment

9-4-12. Chroma Emphasis fo Adjustment (CV-9 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Center terminal of RV208 (REC C)
Measuring Instrument	Oscilloscope
Adjustment Element	FL202
Specified Value	Minimum fo component

Adjustment method:
1) Adjust with FL202 so that amplitude of the flat section of the chroma signal RED section becomes minimum.

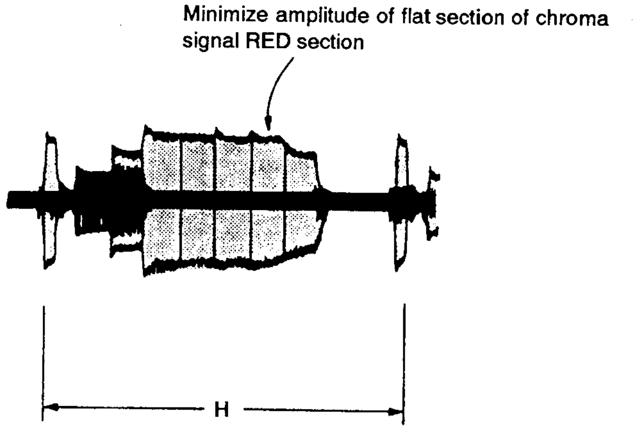

Minimize amplitude of flat section of chroma signal RED section
H

Fig. 9-21. Chroma emphasis fo adjustment

9-4-13. REC Y Level Adjustment (CV-9 Board)

Mode	Recording
Signal	No signal
Measurement Point	Emitter of Q230 (Pin ⑯ of CN502)
Measuring Instrument	Oscilloscope
Adjustment Element	RV207
Specified Value	230 ± 10 mVp-p

Adjustment method:
1) Adjust with RV207 so that it becomes 230 ± 10 mVp-p.

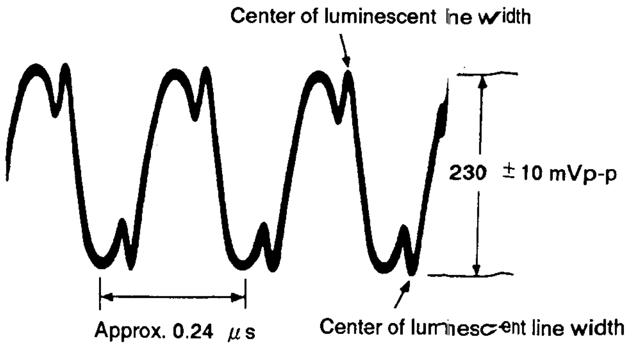

Center of luminescent line width
230 ± 10 mVp-p
Approx. 0.24 μs
Center of luminescent line width

Fig. 9-22. REC Y level Adjustment

9-4-14. REC C Level Adjustment (CV-9 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Emitter of Q233 (Pin ⑱ of CN502)
Measuring Instrument	Oscilloscope
Adjustment Element	RV208
Specified Value	110 ± 10 mVp-p

Adjustment method:

1) Adjust with RV208 so that it becomes 110 ± 5 mVp-p.

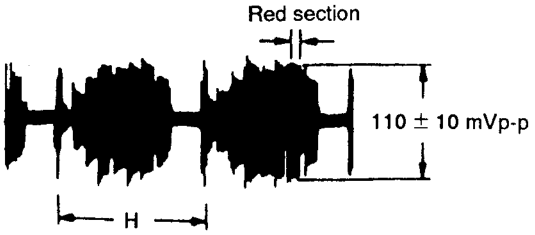


Fig. 9-23. REC C level adjustment

9-4-15. Feedback Chroma Adjustment (PJ-20 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	Emitter of Q107
Measuring Instrument	Oscilloscope
Adjustment Element	RV104
Specified Value	Mininum residual component

Adjusting method:

1) Adjust RV104 so as to mininize the residual chroma component.

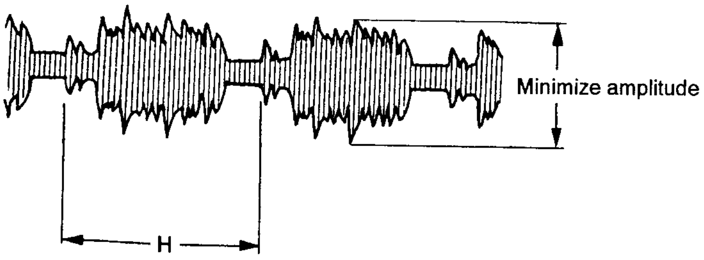


Fig. 9-24.

9-4-16. Quasi Burst Phase Adjustment (PJ-20 Board)

1. Method using vectorscope

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Vectorscope
Adjusting Element	RV102
Specified Value	Phase of color luminance points in quasi burst mode is same as phase of color luminance points in through burst mode

Adjusting method:

1) Memorize of the phase of the color luminance points (especially yellow). (Through burst mode)
2) Connect Pin ㉑ of IC101 and Pin ② of CN202 with a diode (1SS119, etc.). (Quasi burst mode)

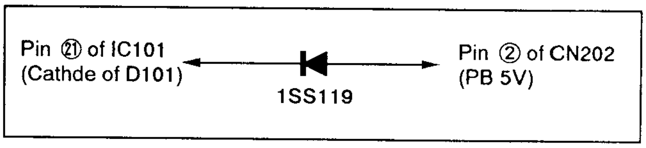


Fig. 9-25.

3) Confirm the color of color bars on the monitor screen. If abnormal, stop the unit and then set the playback mode again.
4) Adjust RV102 so that the phase of the color luminance points is the same as the phase memorized in 1).
5) Remove the diode.

2. Method using monitor TV

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV102
Specified Value	Minimum chroma flickering

Connection:

1) Connect Pin ㉑ of IC101 and Pin ② of CN502 on CV-9 board (RF SWP) using a diode (1SS119, etc.).

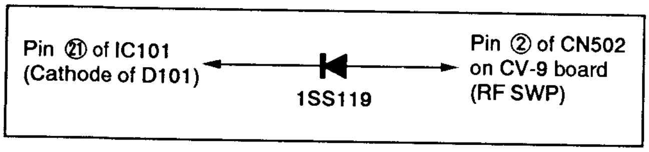


Fig. 9-26.

Adjusting method:

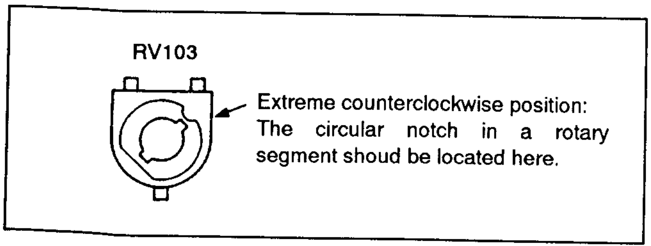
1) Observe the monitor screen. If color is abnormal and considerable chroma flicker occurs, stop the unit and then set the playback mode again.
2) Set the monitor color level to maximum and its bright level to minimum.
3) Minimize chroma flicker with RV102 so that horizontal black stripes cannot longer be seen.
4) Remove the diode.

9-4-17. Delay Burst Phase Adjustment (PJ-20 Board)

Mode	Playback pause (LP mode)
Signal	Alignment tape: For operation checking (WR5-4CL) color bars
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV103
Specified Value	Minimum chroma flickering

Adjusting method:

1) Set the monitor color level to maximum and its bright level to minimum.
2) Rotate RV103 fully in the counterclockwise direction(↺).
3) Turn RV103 slowly clockwise and stop where chroma flicker is minimum and horizontal black stripes are least visible.



RV103
Extreme counterclockwise position:
The circular notch in a rotary segment shoud be located here.

Fig. 9-27.

9-4-18. DDS Character Position Adjustment (CV-9 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP) Color bar section
Measurement Point	Confirm on monitor TV screen
Measuring Instrument	
Adjustment Element	CV501
Specified Value	See Fig. 9-28.

Adjustment method:

1) Press the data screen button for indication of the counter on the monitor TV screen.
2) Adjust CV501 until the right inner contour of the number at the right side of the count indication is lined up with the border line between the blue and black color bars.

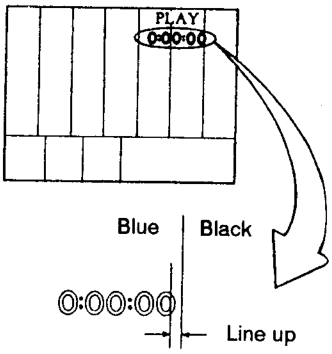


Fig. 9-28.

9-4-19. Character Generator fo Adjustment (CV-9 Board)

Mode	E-E
Signal	Non-signal
Measurement Point	Pin ⑲ of IC501
Measuring Instrument	Frequency counter
Adjustment Element	CV502
Specified Value	15625 ± 100 Hz

Adjustment method:

1) Adjust CV502 so that it becomes 15625 ± 100 Hz.

9-5. AUDIO SYSTEM ADJUSTMENT

- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instruments]
In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the figure below, and set the power switch to the video position for adjustment.

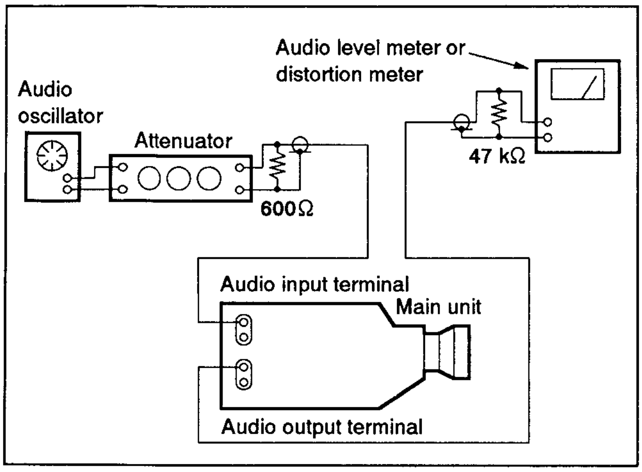
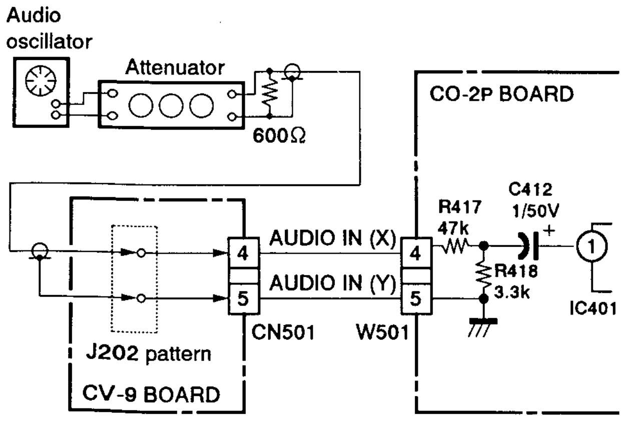

Audio level meter or
distortion meter
Audio
oscillator
Attenuator
47 kΩ
600Ω
Audio input terminal
Main unit
Audio output terminal

Fig. 9-29.

There is not the external input terminal (AUDIO IN) in AEP, UK models. According, perform the following operation.

- Signal input


Audio
oscillator
Attenuator
600Ω
CO-2P BOARD
C412
1/50V
R417
47k
R418
3.3k
AUDIO IN (X)
AUDIO IN (Y)
4
5
4
5
1
IC401
CN501
W501
J202 pattern
CV-9 BOARD

Note: Mount R417, R418 and C412.

Fig. 9-30.

9-5-1. AFM Carrier Frequency Check (CO-2P Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ㉑ of IC401(REC AFM)
Measuring Instrument	Frequency counter
Specified Value	1.50 ± 0.05 MHz

Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

Checking method:
1) Turn OFF the audio oscillator output.
2) Confirm that the AFM carrier frequency is 1.50 ± 0.05 MHz.

9-5-2. REC AFM Carrier Level Adjustment (CO-2P Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ㉑ of IC401 (REC AFM)
Measuring Instrument	Oscilloscope
Specified Value	160 ± 40 mVp-p

Checking method:
1) Confirm that the level is 160 ± 40 mVp-p.

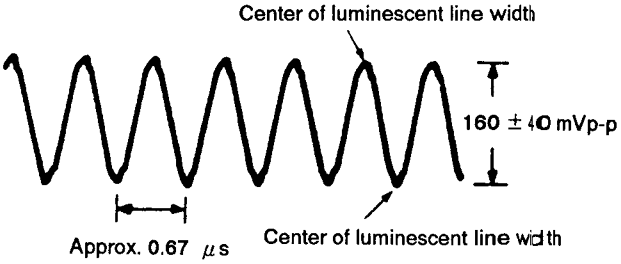


Fig. 9-31. REC AFM recording current adjustment

9-5-3. Playback Level Check

Mode	Playback
Signal	Alignment tape: Operation checking (WR5-5CSP)
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter
Specified Value	-7.5 ± 2 dBs

Checking method:
1) Confirm that the audio output level is -7.5 ± 2 dBs.

9-5-4. E-E Output Level Check

Mode	E-E
Signal	400 Hz, −7.5 dBs
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter
Specified Value	−7.5 ± 2 dBs

Checking method:

1) Make sure that the audio output level is −7.5 ± 2 dBs.

9-5-5. Overall Level Characteristics Check

Mode	Self-recording and playback
Signal	400 Hz, −7.5 dBs
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter
Specified Value	−7.5 ± 3 dBs

Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Make sure that the audio output level is −7.5 ± 3 dBs.

9-5-6. Overall Frequency Characteristics Check

Mode	Self-recording and playback
Signal	Ⓐ 400 Hz, −17.5 dBs Ⓑ 30 Hz, −17.5 dBs Ⓒ 10 Hz, −17.5 dBs
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter
Specified Value	With the 400 Hz playback output level as 0 dB, the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB

Checking method:

1) Record signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400 Hz playback output level as 0 dB, confirm that the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB.

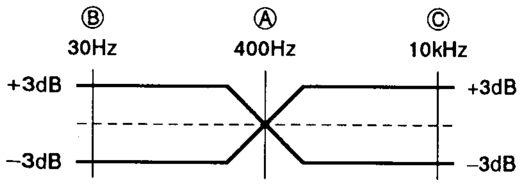


Fig. 9-32. AFM overall frequency characteristics

9-5-7. Overall Distortion Check

Mode	Self recording and playback
Signal	400 Hz, −7.5 dBs
Measurement Point	Audio output terminal
Measuring Instrument	Distortion meter
Specified Value	Less than 0.5% *1

Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Confirm that the distortion is less than 0.5%. *1
   *1 Value when 200 Hz – 6 kHz BPF is used

9-5-8. Overall Noise Level Check

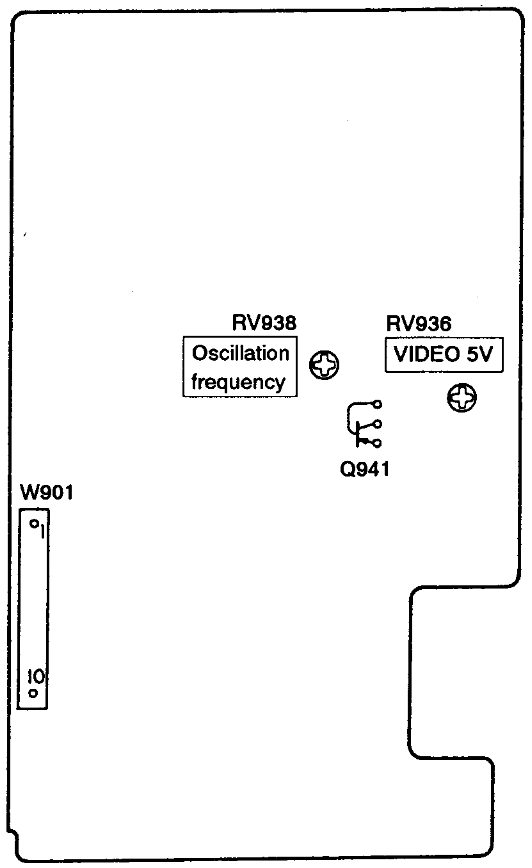
Mode	Self-recording and playback
Signal	No signal (shorting plug is inserted into audio input jack)
Measurement Point	Audio input terminal
Measuring Instrument	Audio level meter
Specified Value	Less than −67 dBs*2

Checking method:

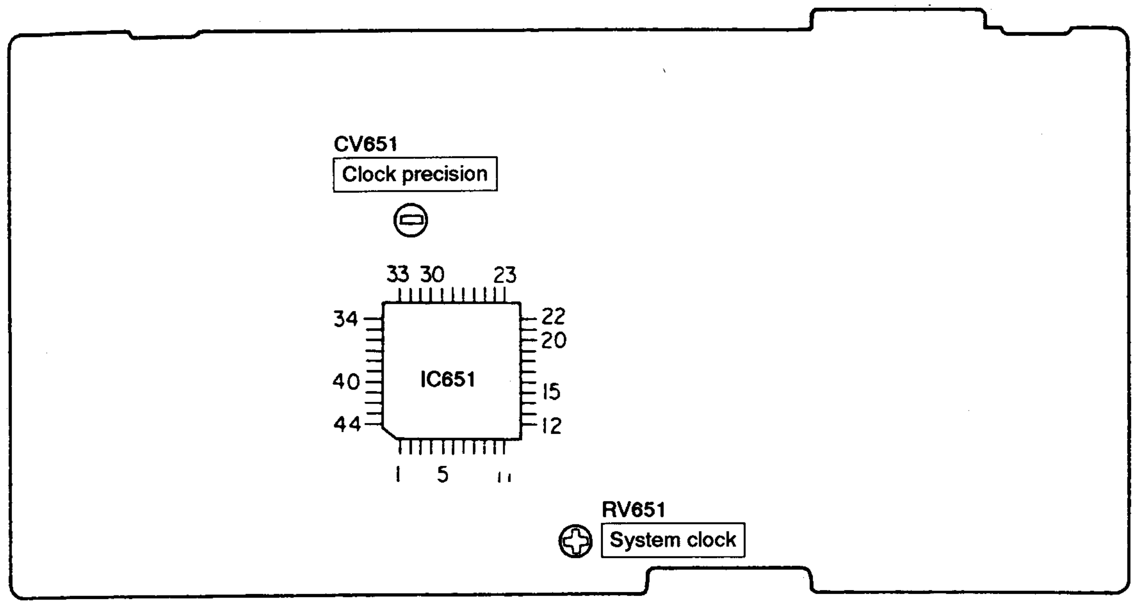
1) Record the signal.
2) Playback the recorded section.
3) Make sure that the noise level is less than −67 dBs. *2
   *2 Value when IHF-A hearing correction filter is used.

9-6. ADJUSTMENT ELEMENTS LOCATION

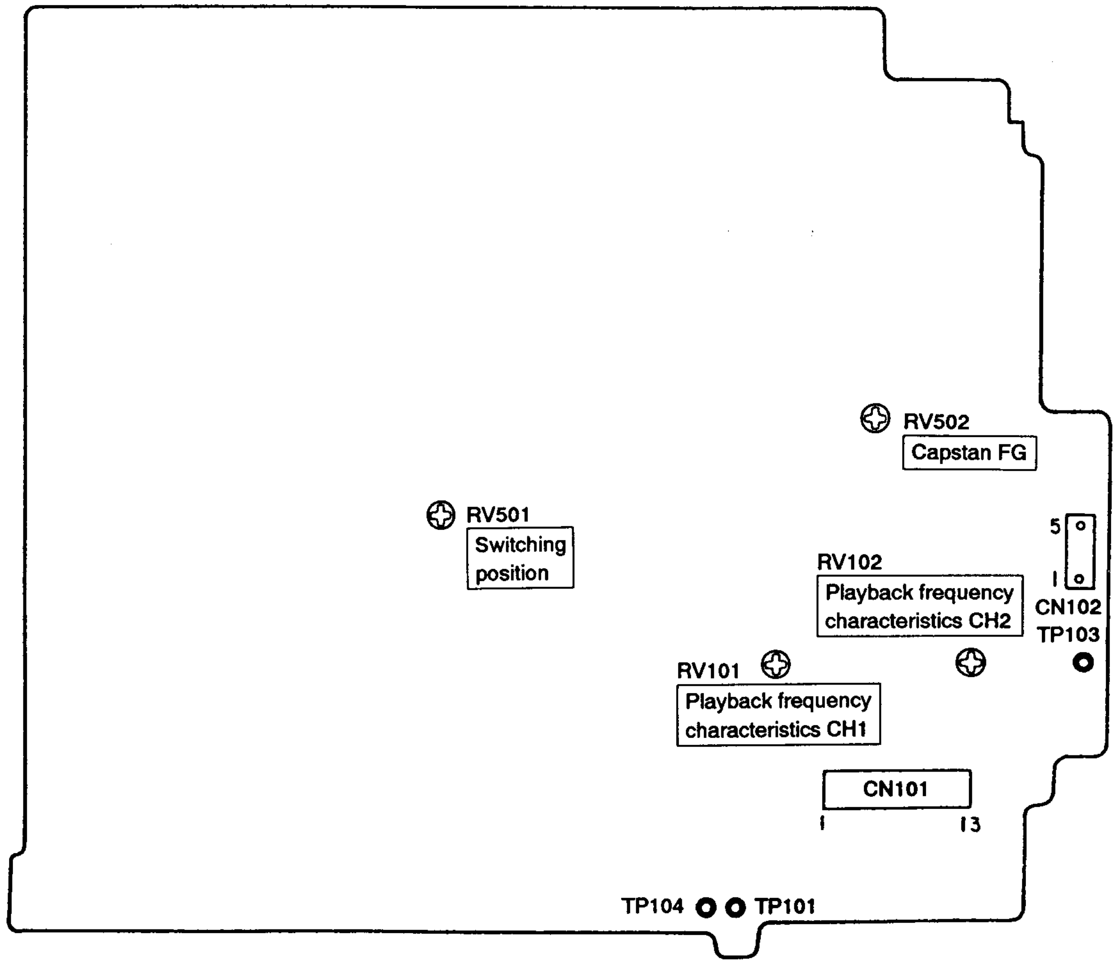
PS-225P BOARD (COMPONENT SIDE)


RV938
Oscillation frequency
RV936
VIDEO 5V
Q941
W901
1
10

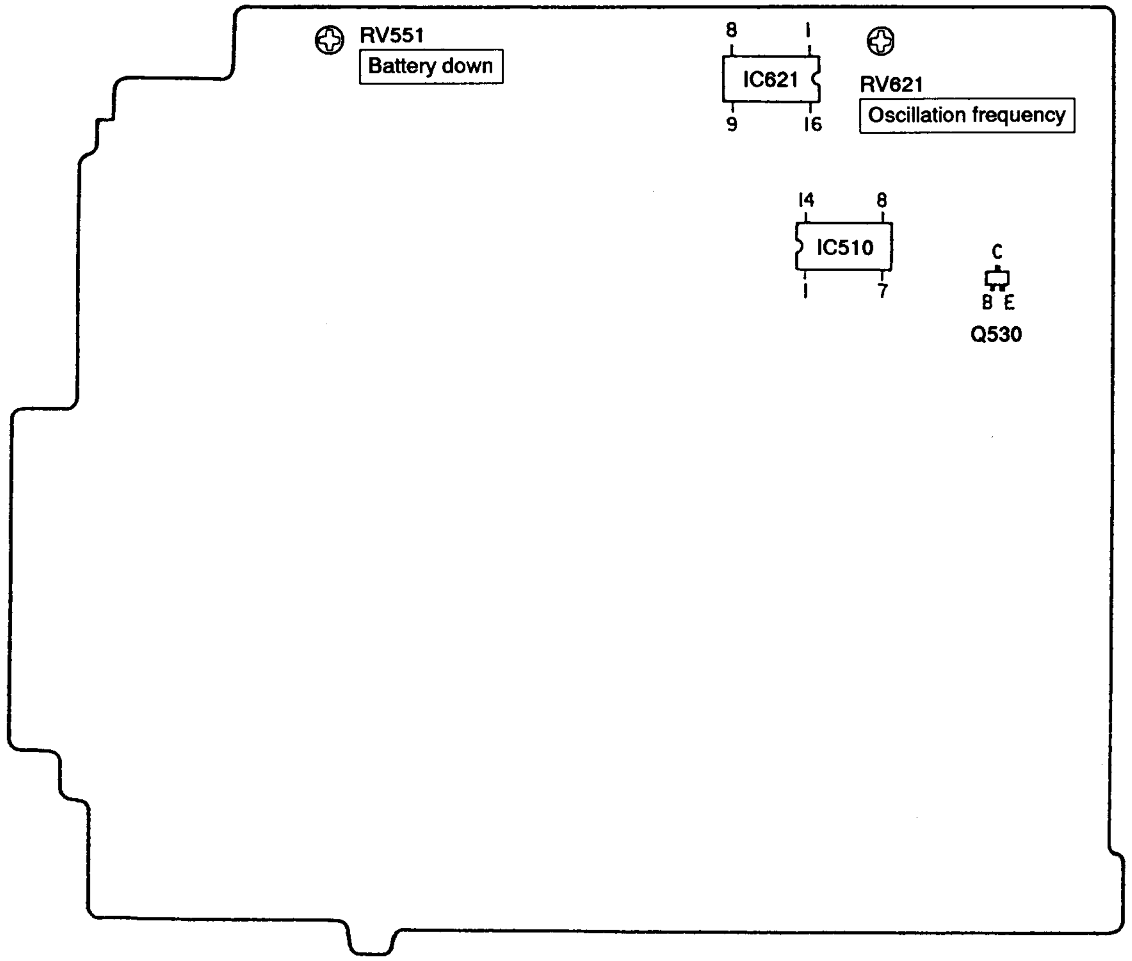
CK-19P BOARD (COMPONENT SIDE)


CV651
Clock precision
33 30 23
34
22
20
40
IC651
15
44
12
1 5 11
RV651
System clock

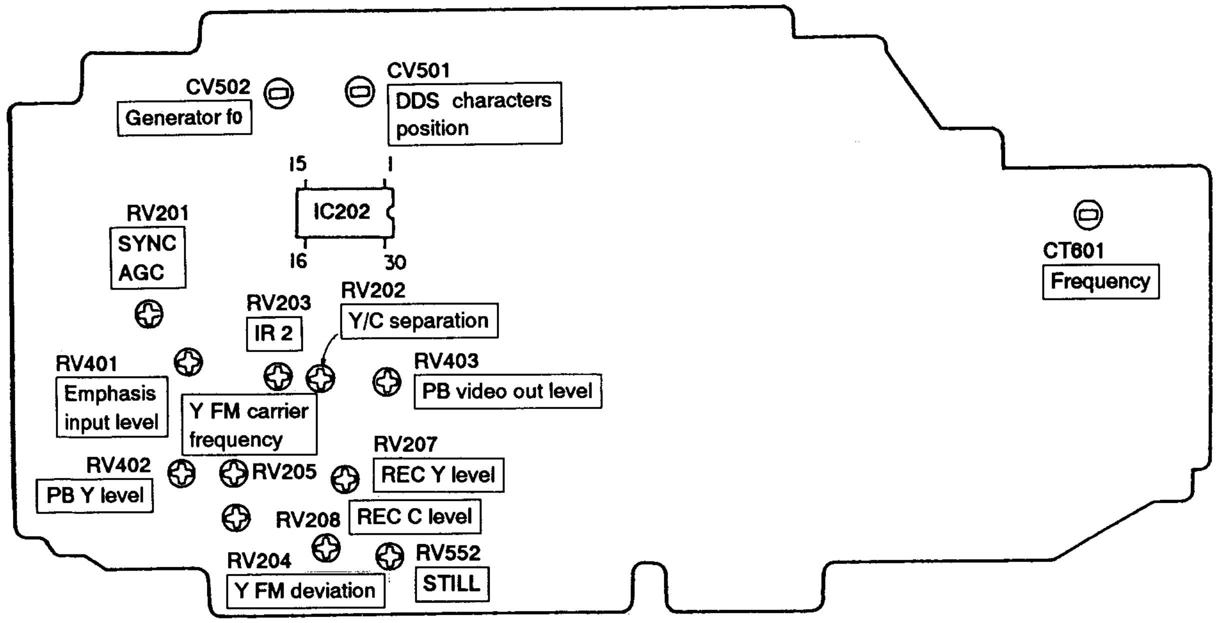
CO-2P BOARD (CONDUCTOR SIDE)


RV502
Capstan FG
RV501
Switching position
5
1
RV102
Playback frequency characteristics CH2
CN102
TP103
RV101
Playback frequency characteristics CH1
CN101
1
13
TP104
TP101

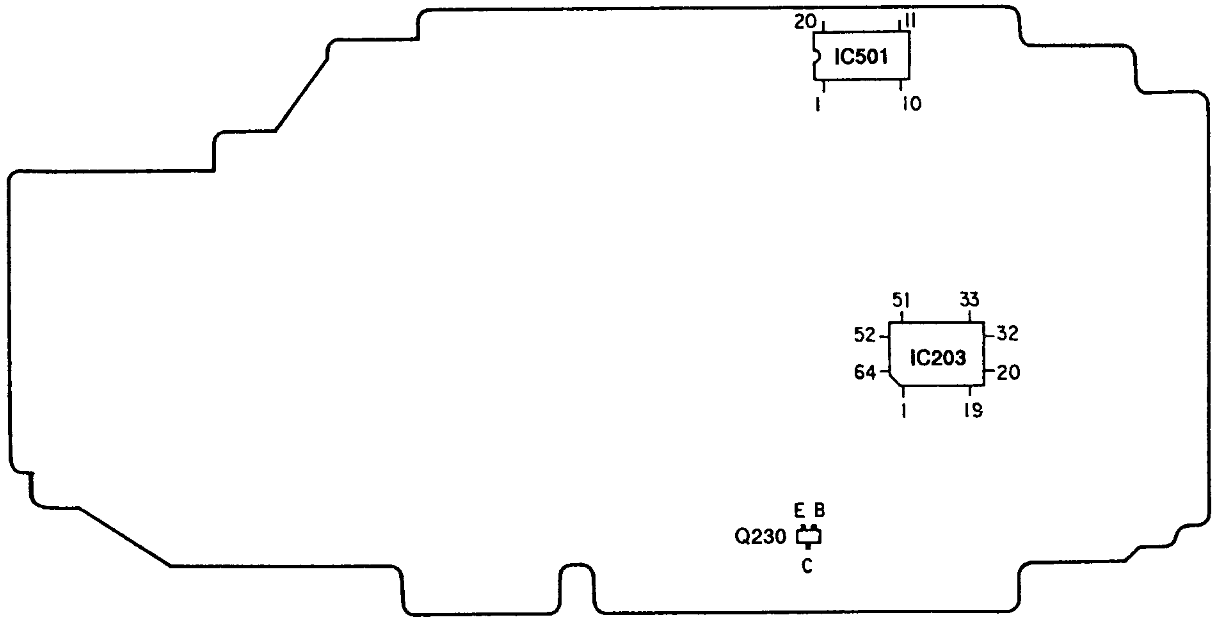
CO-2P BOARD (COMPONENT SIDE)


RV551
Battery down
8 1
IC621
9 16
RV621
Oscillation frequency
14 8
IC510
1 7
C
B E
Q530

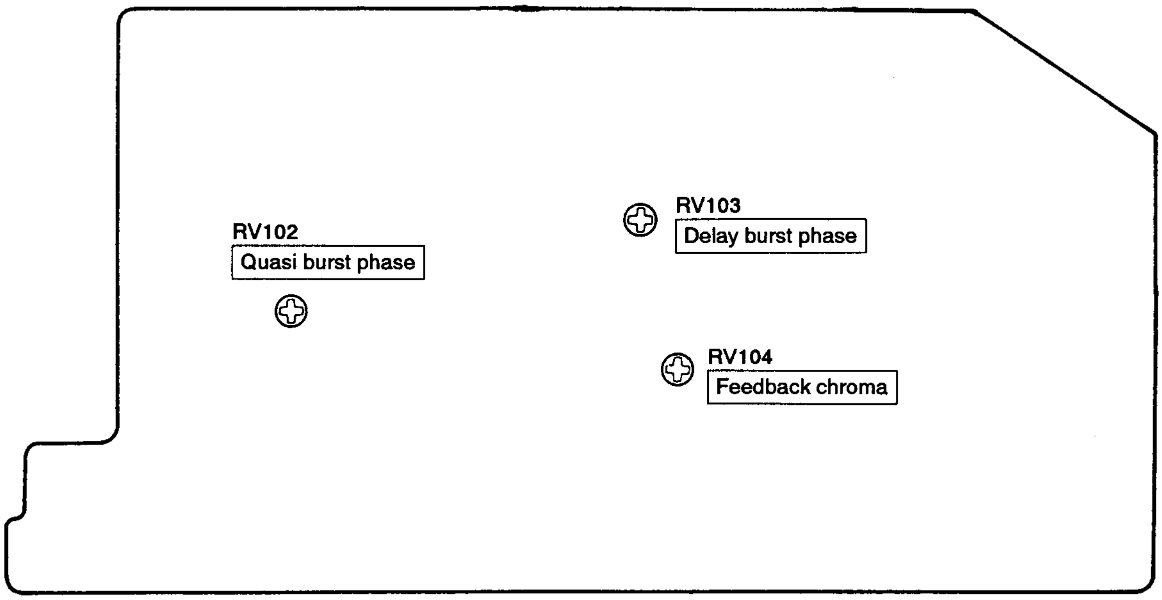
CV-9 BOARD (COMPONENT SIDE)


CV502
Generator fo
CV501
DDS characters position
15
1
IC202
16
30
RV201
SYNC AGC
CT801
Frequency
RV203
IR 2
RV202
Y/C separation
RV401
Emphasis input level
Y FM carrier frequency
RV403
PB video out level
RV207
RV402
RV205
REC Y level
PB Y level
RV208
REC C level
RV204
RV552
Y FM deviation
STILL

CV-9 BOARD (CONDUCTOR SIDE)


20
11
IC501
1
10
51
33
52
32
IC203
64
20
1
19
E B
Q230
C

PJ-20 BOARD (COMPONENT SIDE)

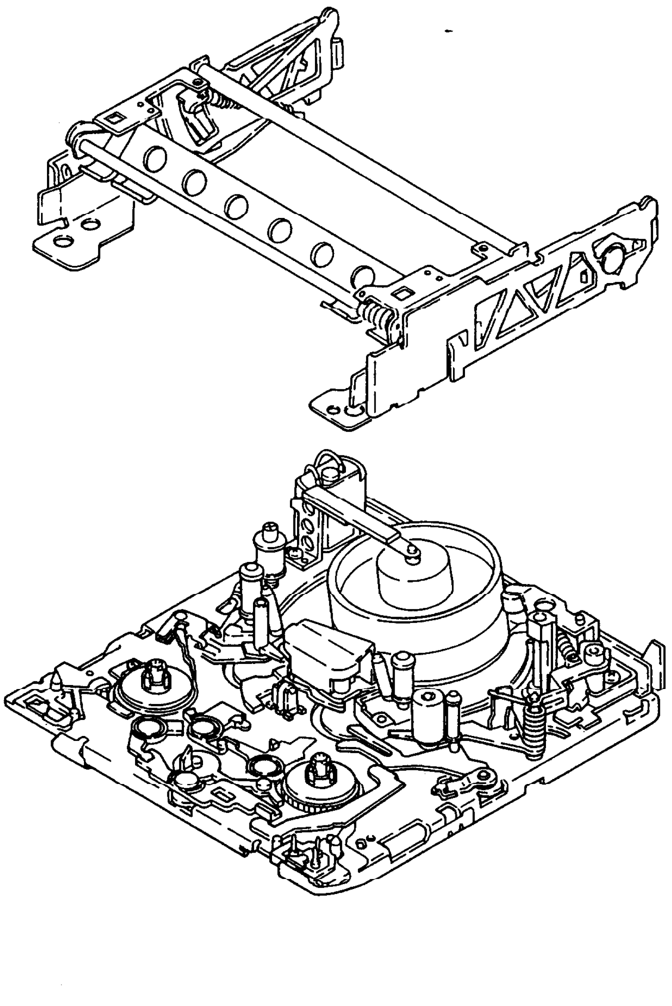

RV102
Quasi burst phase
RV103
Delay burst phase
RV104
Feedback chroma

mm Video MECHANICAL ADJUSTMENT MANUAL III

U MECHANISM

Video 8

Please use in conjunction with the SERVICE MANUAL.



8 MECHANISM DECK

SONY®

TABLE OF CONTENTS

Section Title Page

1. PREPARATIONS FOR MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

1-1. Operation without Cassette Compartment Assembly and Tape ········ 3
1-1-1. How to Trigger the Loading Operation ········ 3
1-1-2. Setting the Playback Mode ········ 3
1-1-3. Eject Operation ········ 3
1-2. The Mode Selector ········ 4
1-2-1. Name of Each Part (external) ········ 4
1-2-2. Connections ········ 4
1-2-3. Handling ········ 4

2. PERIODICAL CHECK AND MAINTENANCE

2-1. Rotary Drum Assembly Cleaning ········ 5
2-2. Tape Path Cleaning ········ 5
2-3. Drive System Cleaning ········ 5
2-4. Periodical Check Items ········ 6
2-5. Servicing Tools ········ 7

3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

3-1. HC Roller Assembly ········ 8
3-2. Guide Guard Assembly ········ 8
3-3. DC Motor (Capstan Motor) Assembly ········ 9
3-4. S Brake, T Brake ········ 10
3-5. LB Brake, Axle Holding Pins ········ 11
3-6. LB Release Arm ········ 12
3-7. RK Stopper, RK Stopper Arms ········ 12
3-8. Pinch Arm Assembly, TG-7 Assembly ········ 13
3-9. TG-2 Assembly ········ 14
3-10. S Reel Table Assembly, T Reel Table Assembly ········ 15
3-11. Tension Regulator Band Assembly, Tension Regulator Arm Assembly ········ 16
3-12. Tension Regulator FWD Position Preset ········ 17
3-13. Drum Assembly, Dew Sensor ········ 18
3-14. Eject Lever, Switch Lever Assembly, Pinch Roller Sub Arm Assembly ········ 19
3-15. Timing Belt (L), RC Gear Assembly, Loading Lever Assembly, Timing Belt (S), Connecting Gear Assembly ········ 20
3-16. Idler Pulley, TS Brake Assembly, LB Gear Assembly, RK Gear Assembly ········ 21
3-17. UL Gear, UL Brake, UL Arm, LB Plate Spring ········ 22
3-18. Coaster (Right) Assembly, Drive Gear (Right) Assembly ········ 23
3-19. Coaster (Left) Assembly, Drive Gear (Left) Assembly ········ 24
3-20. Loading Motor, Brake Release Arm, Wheel Gear, Worm Assembly ········ 25
3-21. Rotary Upper Drum Replacement ········ 26
3-22. FWD Back Tension ········ 27
3-23. Reel Torque Check ········ 27

Section Title Page

4. TAPE PATH ADJUSTMENT

4-1. Track Shift Mode Setting ········ 28
4-2. Preparations for Adjustment ········ 29
4-3. Tracking Adjustment ········ 30
4-4. Tracking Fine Adjustment ········ 30
4-5. No.2 Guide (TG-2) Adjustment ········ 30
4-5-1. No.2 Guide (TG-2) Height Presetting ········ 30
4-5-2. No.2 Guide (TG-2) Adjustment ········ 31
4-6. No.7 Guide (TG-7) Adjustment ········ 31
4-7. Cue and REV Waveform Check ········ 31
4-8. Check After Adjustment ········ 32
4-8-1. Tracking Check ········ 32
4-8-2. Rising Check ········ 32
4-8-3. Tape Path Check ········ 32

1. PREPARATIONS FOR MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Note: For removal of the cabinet, the boards, the cassette compartment, etc., refer to the service guides.

1-1. OPERATION WITHOUT CASSETTE COMPARTMENT ASSEMBLY AND TAPE

Note: The unit will not work if exposed to a strong light.

1-1-1. How to Trigger the Loading Operation (See Fig. 1-1.)

1) Supply power to the unit after removing the cabinet, the camera block, the cassette compartment assembly, etc., as indicated in the service guides. (This will enable operation of the mechanical deck.)
2) Cover the LED assembly with an opaque cap, etc. ❶.
3) Attach a piece of tape to the RECOG switch ❷ so that the pin is held down.
4) Push the EJECT lever ❸ in the direction of the arrow Ⓐ.

1-1-2. Setting the Playback Mode (See Fig. 1-1.)

1) Follow the procedures in section 1-1-1. above.
2) Put the rubber band ❹ around the S and T reels.
3) Press the PLAY switch of unit, then push the tension regulator arm assembly ❺ in the direction of the arrow Ⓑ when the T reel starts to rotate (the tension regulator band will be released, and the S reel will start rotating).
4) To stop operation, press the STOP switch.

1-1-3. Eject Operation (See Fig. 1-1.)

1) To eject, turn the EJECT switch on.

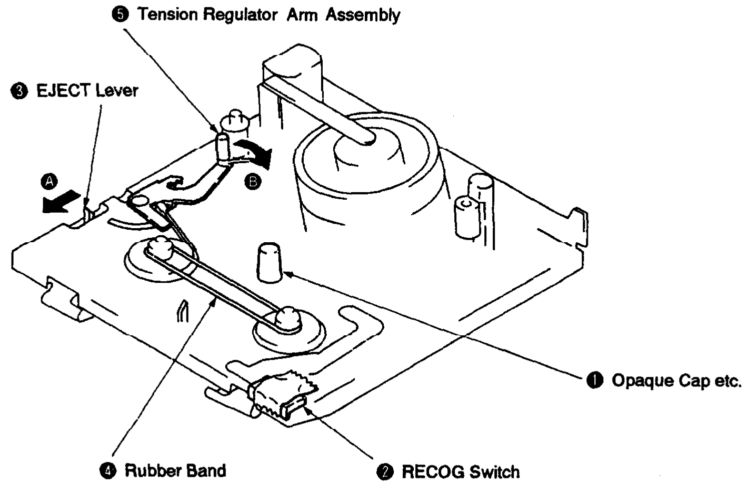


Fig. 1-1.

1-2. THE MODE SELECTOR

1-2-1. Name of Each Part (external) (See Fig. 1-2.)

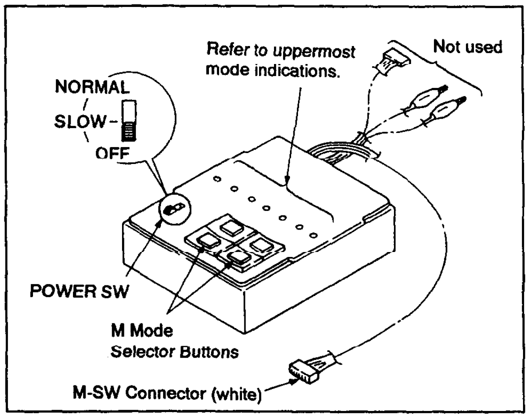

Refer to uppermost mode indications.
Not used
NORMAL
SLOW
OFF
POWER SW
M Mode Selector Buttons
M-SW Connector (white)

Fig. 1-2.

1-2-2. Connections (See Fig. 1-3.)

1) Mount the MODE SELECTOR III panel (Ref. No. J-9) ❶ onto the mode selector.
2) Attach the conversion connector (Ref. No. J-8) ❸ of MODE SELECTOR III to the 6-pin connector (white) ❷ of the mode selector M-SW.
3) Remove the FP-89 flexible board ❺ from the flexible connector ❹.
4) Attach the FP-89 flexible board ❺ to the flexible connector ❻ of the MODE SELECTOR III conversion connector ❸, then attach the 2-pin connector (white) ❽ of the loading motor to the 2-pin connector (white) ❼.

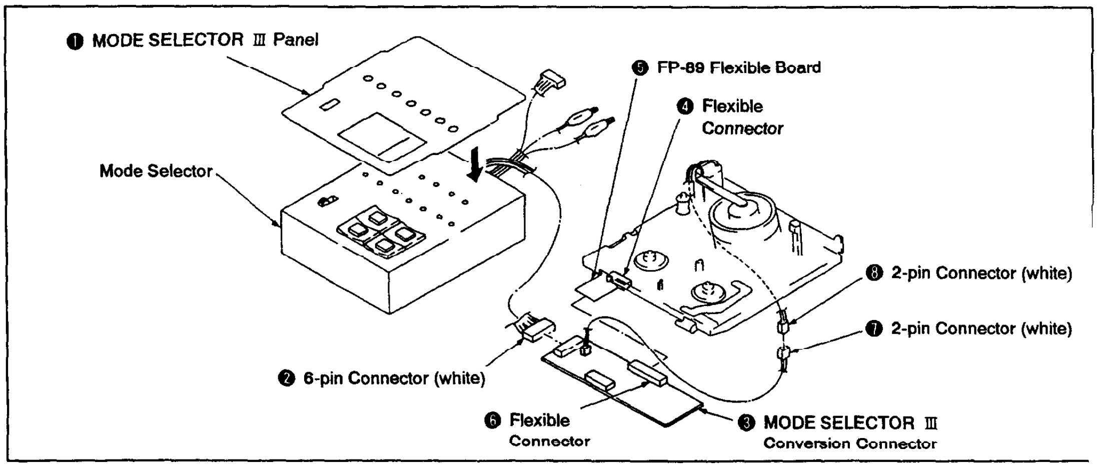

❶ MODE SELECTOR Ⅲ Panel
Mode Selector
❺ FP-89 Flexible Board
❹ Flexible Connector
❽ 2-pin Connector (white)
❼ 2-pin Connector (white)
❷ 6-pin Connector (white)
❻ Flexible Connector
❸ MODE SELECTOR Ⅲ Conversion Connector

Fig. 1-3.

1-2-3. Handling (See Figs. 1-2. and 1-4.)

- Use only the M mode selector buttons.
- Refer to mode indications on the uppermost part of the MODE SELECTOR III panel.
- If the right M mode selector button is kept pressed, the lit indication will change in the order of EJECT → (IA) → ULD → (IB) → STOP → (IC) → FWD.
- To change modes in the reverse direction (from FWD to EJECT), press the left selector button.

Note: For this U mechanism, the uppermost indicators on the MODE SELECTOR III panel are used. The IA, IB and IC indications light up during mode changes.

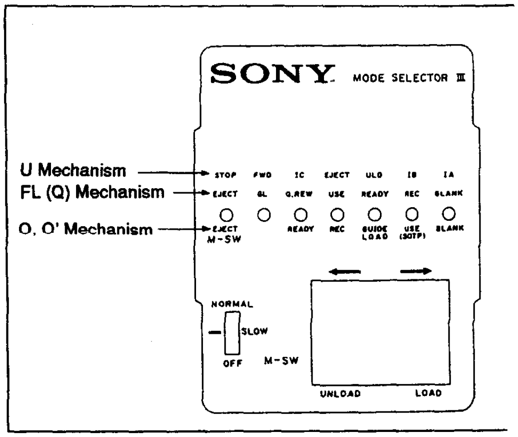

SONY MODE SELECTOR Ⅲ
U Mechanism
FL (Q) Mechanism
O, O' Mechanism
STOP FWD IC EJECT ULD IB IA
EJECT GL Q.REW USE READY REC BLANK
EJECT READY REC GUIDE LOAD USE (SOTP) BLANK
M-SW
NORMAL
SLOW
OFF
M-SW
UNLOAD
LOAD

Fig. 1-4.

2. PERIODICAL CHECK AND MAINTENANCE (See Fig. 2-1.)

The following periodical check and maintenance procedures are necessary to ensure proper operation and to protect the tapes as well as the unit, and the following maintenance procedures must be always carried out after repairing regardless of how long the unit has been used.

2-1. ROTARY DRUM ASSEMBLY CLEANING

1) While pressing a piece of chamois leather (Ref. No. J-2) moistened in cleaning fluid (Ref. No. J-1) lightly against the rotary drum, turn the rotary upper drum slowly counter-clockwise with your fingers.

Note: Do not drive the drum with the motor, and do not turn it clockwise.
Do not move the chamois leather vertically against the head tip; this can damage the head tip. Strictly follow the cleaning instructions above.

2-2. TAPE PATH CLEANING

1) Set the cassette compartment assembly to the eject state, or remove it. Then clean the tape path (guides No. 1 to 7, capstan shaft, pinch rollers) with a piece of chamois leather moistened in cleaning fluid (See Fig. 2-1).

2-3. DRIVE SYSTEM CLEANING

1) Clean the drive system (timing belt, reel table surface) with a piece of cloth moistened in cleaning fluid.

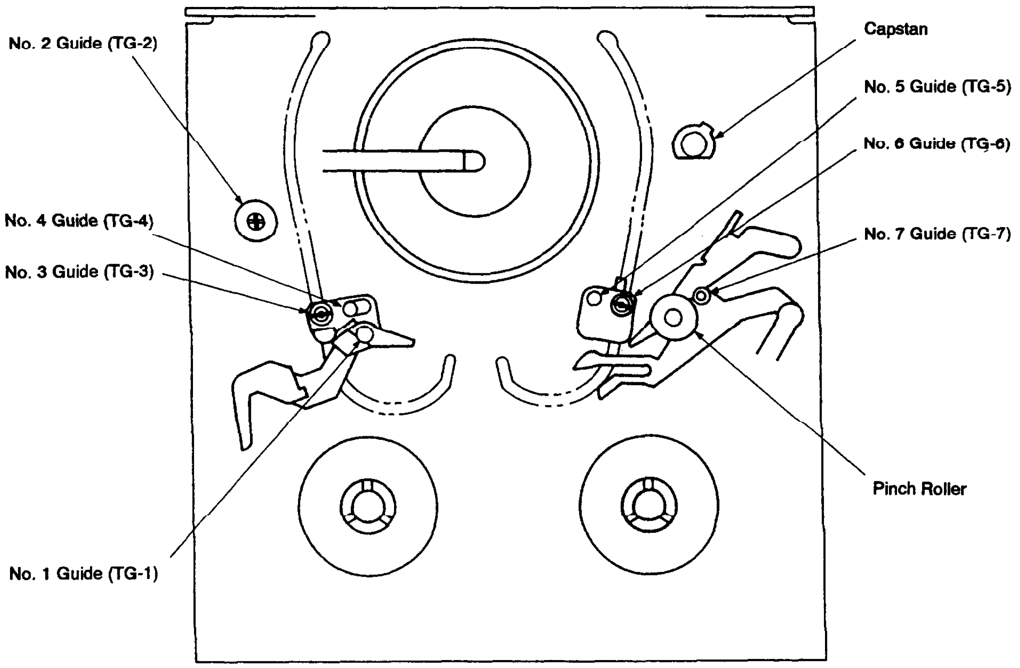


Fig. 2-1.

2-4. PERIODICAL CHECK ITEMS

○Cleaning ◎Lubrication ☆Check

Maintenance and Check Item		Operation time (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Cleaning and Demag-netizing	Tape path surfaces Cleaning	○	○	○	○	○	○	○	○	○	○	Do not oil.
	Rotary drum assembly cleaning and demagnetizing	○	○	○	○	○	○	○	○	○	○	Do not oil.
Drive System	Relay belt (short)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-866-01
	Relay belt (long)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-865-01
	Capstan shaft	–	◎	–	◎	–	◎	–	◎	–	◎	Take care that no oil gets on tape path surfaces.
	Idler pulley axle	–	◎	–	◎	–	◎	–	◎	–	◎	
	Loading motor	–	☆	–	☆	–	☆	–	☆	–	☆	1-541-612-11
Perfor-mance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD, RVS torque measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

Notes: When overhauling the unit, perform parts replacement referring to the table above.

Regarding Oil:

- Always use the specified oil (using oil of different viscosity, etc. can cause troubles of several kinds).
  Specified oil: Part No. 7-661-018-01
  (Mitsubishi Diamond Oil Hydrofluid EP56)
- Be sure that no dirt is mixed in the oil to be used on axle bearings. Use of dirty oil can result in bearing wear and burning.
- By "one drop of oil" is meant the quantity of oil adhering to the end of a a 2mm-diameter rod as shown in Fig. 2-2.

On grease:

- Use the specified grease.
  Grease: Part No. 7-662-010-08
  (Sony grease SGL-701)

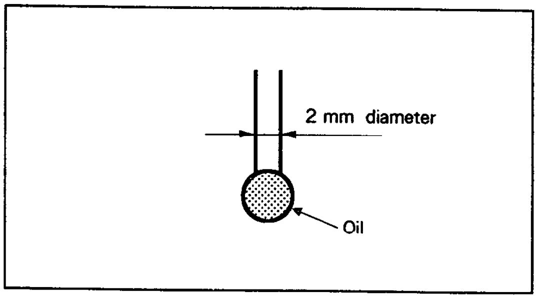


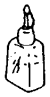
Fig. 2-2.

2-5. SERVICING TOOLS

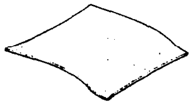
Ref. No.	Name	Part Code	Marking	Application, etc.
J-1	Cleaning fluid	Y-2031-001-0	–	
J-2	Chamois cloth	2-034-697-00	–	
J-3	Head demagnetizer	Commercially available	–	
J-4	Dental mirror Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-5	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-6	FWD/RVS takeup torque cassette	J-6080-624-A	GD-2086	
J-7	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-8	Mode selector III conversion connector	J-6082-021-A		General
J-9	Mode selector III panel	J-6082-023-A		General
J-10	Mode selector	J-6080-825-A		General
J-11	Hexagonal wrench detection (0.89 mm) or L wrench (0.89 mm)	7-700-766-01 7-700-736-06		Tape path
J-12	Sony grease (SGL-701)	7-662-010-08		

Other devices: Oscilloscope
Analog tester (20 kΩ)

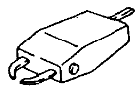
J-1



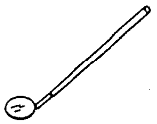
J-2



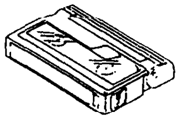
J-3



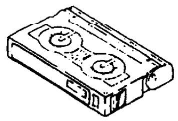
J-4



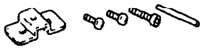
J-5



J-6

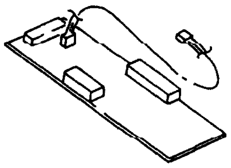


J-7

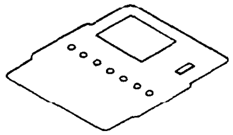


(Attached to the maintenance rotary upper drum)

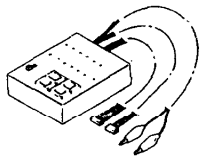
J-8



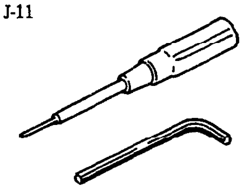
J-9



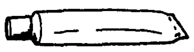
J-10



J-11



J-12



3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Notes:
- Use the mode selector (Ref. No. J-10) for procedures in this chapter.
- Modes within a frame ☐ are those set by pressing the buttons of the mode selector.

3-1. HC ROLLER ASSEMBLY

1. Removal (See Fig. 3-1.)

1) Remove the screw ❶, then remove the HC roller assembly ❷.

2. Installation (See Fig. 3-1.)

1) Align the two dowels ❸ attached to the HC roller assembly ❷ with the two holes ❹ in the mechanism chassis.
2) Secure the HC roller assembly ❷ with the screw ❶.

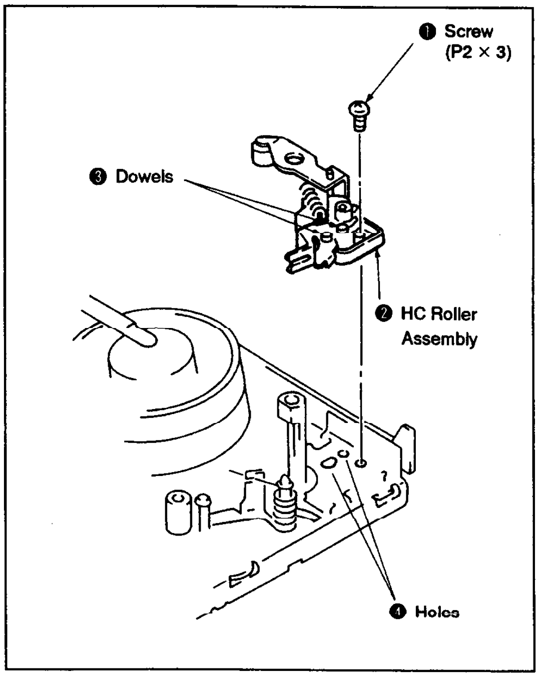

❶ Screw (P2 × 3)
❸ Dowels
❷ HC Roller Assembly
❹ Holes

Fig. 3-1.

3-2. GUIDE GUARD ASSEMBLY

1. Removal (See Fig. 3-2.)

Remove the screw ❶, then remove the guide guard assembly ❷.

2. Installation (See Fig. 3-2.)

1) Align the dowel ❸ attached to the guide guard assembly ❷ with the hole ❹.
2) Secure the guide guard assembly ❷ with the screw ❶.

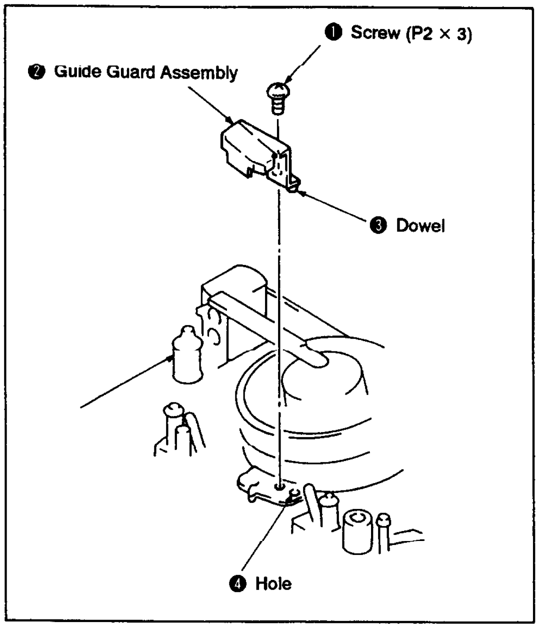

❶ Screw (P2 × 3)
❷ Guide Guard Assembly
❸ Dowel
❹ Hole

Fig. 3-2.

3-3. DC MOTOR (CAPSTAN MOTOR) ASSEMBLY

1. Removal (See Fig. 3-3.)

1) Set the ULD mode.
2) Turn the stopper ❶ in the direction of the arrow Ⓐ as far as it will go.
3) Remove the two screws ❷, then remove the DC motor ❸.

2. Installation (See Fig. 3-3.)

1) Align the two screwed dowels ❹ with the two holes ❺, then engage the toothed part ❻ with the connecting gear ❼.
2) Secure the DC motor assembly ❸ with the two screws ❷.
3) Turn the stopper ❶ in the direction of the arrow Ⓑ as far as it will go.

Note:
- When engaging the gears, take care not to damage their teeth.
- Do not leave any clearance between the DC motor ❸ and the chassis.
- Do not touch the capstan motor axle*, the oil seal* and the rotor*.

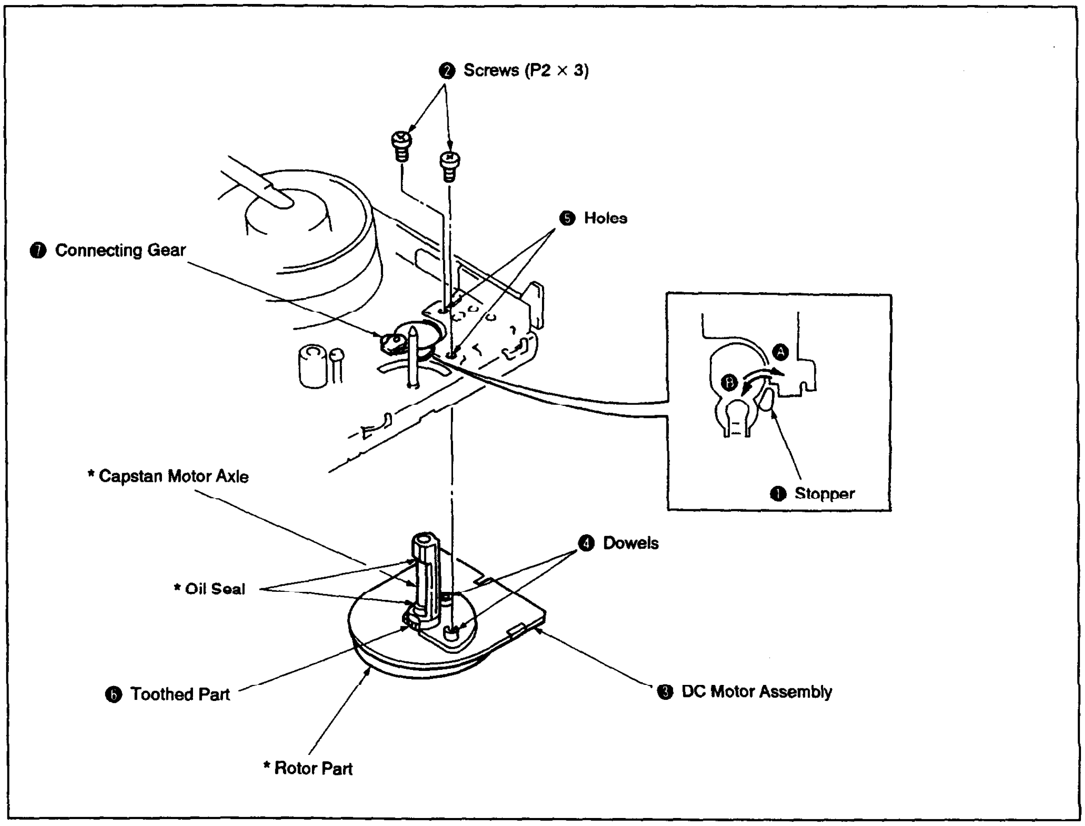

❷ Screws (P2 × 3)
❺ Holes
❼ Connecting Gear
Ⓐ
Ⓑ
❶ Stopper
* Capstan Motor Axle
❹ Dowels
* Oil Seal
❻ Toothed Part
❸ DC Motor Assembly
* Rotor Part

Fig. 3-3.

3-4. S BRAKE, T BRAKE

1. Removal (See Fig. 3-4.)

1) Remove the torsion coil spring (ST) ①.
2) Remove the axle holding pin ②, then remove the T brake ③.
3) Remove the axle holding pin ④, then remove the S brake ⑤.

2. Installation (See Fig. 3-4.)

1) While fitting the toothed part ⑥ into the notch ⑦, mount the S brake ⑤.
2) Insert the axle holding pin ④.
3) Insert the axle ⑧ to the S reel side of the brake release arm ⑨ so that the Ⓐ part comes closer to the drum than part Ⓑ, and mount the T brake ③.
4) Insert the axle holding pin ②.
5) Insert the torsion coil spring (ST) ① below the claw ⑪ of the axle ⑩, then hook it to two claws ⑫.

Note: Confirm that the claws of axle holding pins ② and ④ are not broken before assembling.

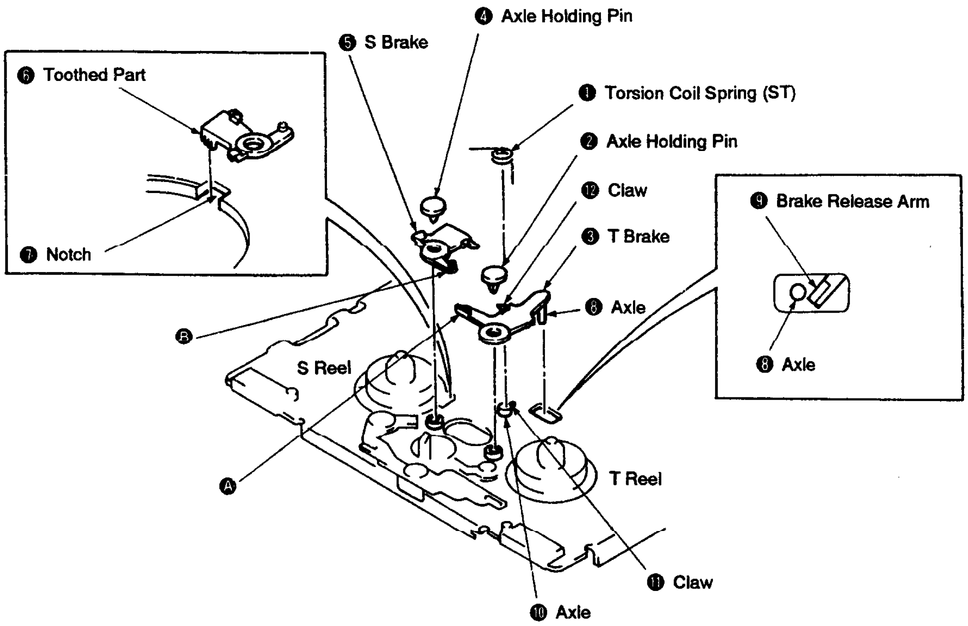

④ Axle Holding Pin
⑤ S Brake
⑥ Toothed Part
① Torsion Coil Spring (ST)
② Axle Holding Pin
⑫ Claw
⑨ Brake Release Arm
③ T Brake
⑦ Notch
⑧ Axle
Ⓑ
S Reel
⑧ Axle
Ⓐ
T Reel
⑪ Claw
⑩ Axle

Fig. 3-4.

3-5. LB BRAKE, AXLE HOLDING PINS

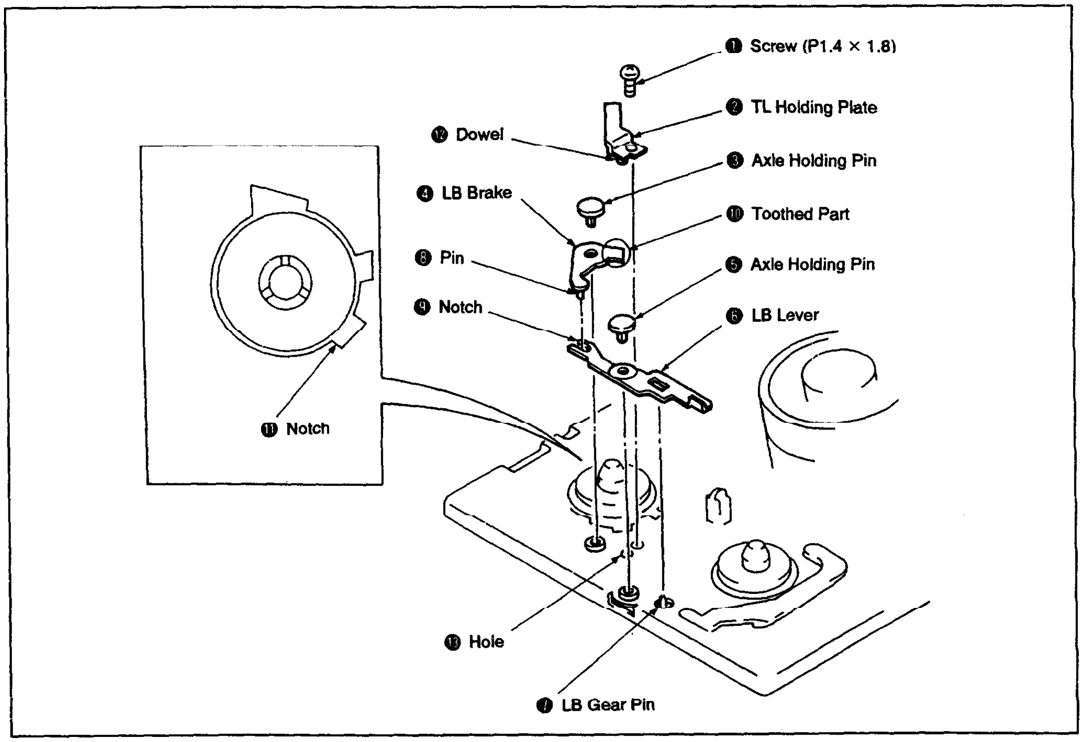
1. Removal (See Fig. 3-5.)

1) Remove the screw ①, then remove the TL holding plate ②.
2) Remove the axle holding pin ③, then remove the LB brake ④.
3) Remove the axle holding pin ⑤, then remove the LB lever ⑥.

2. Installation (See Fig. 3-5.)

1) Mount the LB lever ⑥ matching it to pin ⑦ of the LB gear, then secure it with the axle holding pin ⑤.
2) Insert the pin ⑧ into the notch ⑨ of the LB lever ⑥, then mount the LB brake ④ while inserting the toothed part ⑩ into the notch ⑪.
3) Insert the axle holding pin ③.
4) Align the dowel ⑫ with the hole ⑬, then mount the TL holding plate and secure it with the screw ①.

Note: Confirm that the claws of axle holding pins ③ and ⑤ are not broken before assembling.



① Screw (P1.4 × 1.8)
② TL Holding Plate
⑫ Dowel
③ Axle Holding Pin
④ LB Brake
⑩ Toothed Part
⑧ Pin
⑤ Axle Holding Pin
⑨ Notch
⑥ LB Lever
⑪ Notch
⑬ Hole
⑦ LB Gear Pin

Fig. 3-5.

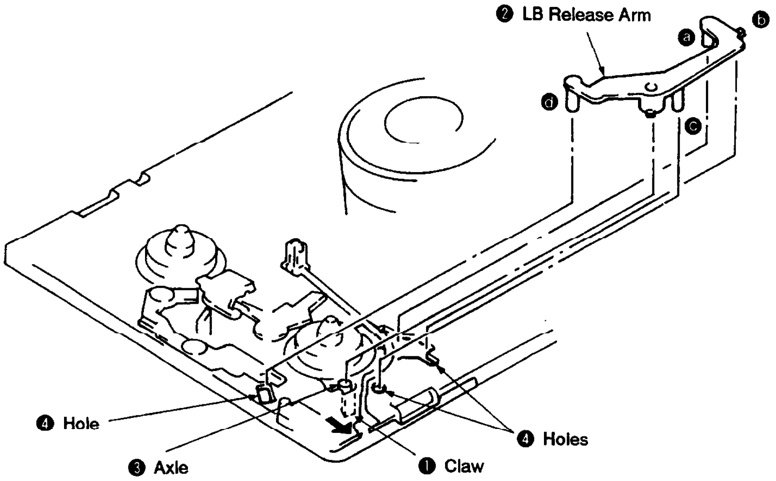
3-6. LB RELEASE ARM

1. Removal (See Fig. 3-6.)

1) While pushing the claw ❶ in the direction of the arrow, remove the LB release arm ❷.

2. Installation (See Fig. 3-6.)

1) Fit the LB release arm ❷ to the axle ❸, insert protrusions ⓐ, ⓑ, ⓒ, ⓓ into the three holes ❹, then secure with the claw ❶.



❷ LB Release Arm
ⓐ
ⓑ
ⓓ
ⓒ
❹ Hole
❹ Holes
❸ Axle
❶ Claw

Fig. 3-6.

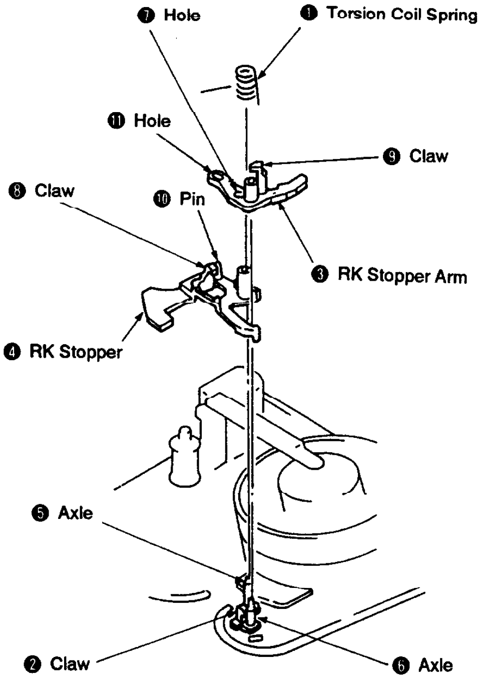
3-7. RK STOPPER, RK STOPPER ARMS

1. Removal (See Fig, 3-7.)

1) Remove the torsion coil spring (RK) ❶.
2) Open the chassis claw ❷, then remove the RK stopper arm ❸.
3) Remove the RK stopper ❹.

2. Installation (See Fig. 3-7.)

1) Mount the RK stopper ❹ onto the axle ❺.
2) Mount the RK stopper arm ❸ onto the axle ❻, insert Pin ❿ into hole ⓫, then hook the claw ❼ of the chassis to the hole ❼.
3) Insert the torsion coil spring (RK) ❶ into the axle ❺, then hook it to claws ❽ and ❾.



❼ Hole
❶ Torsion Coil Spring
⓫ Hole
❾ Claw
❽ Claw
❿ Pin
❸ RK Stopper Arm
❹ RK Stopper
❺ Axle
❷ Claw
❻ Axle

Fig. 3-7.

3-8. PINCH ARM ASSEMBLY, TG-7 ASSEMBLY

1. Removal (See Fig. 3-8.)

1) Set the $\boxed{\text{IB}}$ mode.
2) Remove the stopper washer ❶, then remove the pinch arm assembly ❷.
3) Bend the claw ❹ inside hole ❸ in the direction of the arrow using a thin screwdriver or the like, then remove the TG-7 plate spring ❺.
4) Remove the TG-7 arm assembly ❻.

2. Installation (See Fig. 3-8.)

1) Grease the inner surfaces of hole ❼ (See Fig. A).
2) Insert the axle ❽ of the TG-7 arm assembly ❻ into the hole ❼.
3) Grease the shaded section ⓐ (See Fig. A).
4) Insert the TG-7 plate spring ❺ into the hole ❸, then secure it with the claw ❹.
5) Apply half a drop of oil to the axle ❾ (See Fig. B).
6) Fit the pinch arm assembly ❷ to the axle ❾ and insert the pinch roller sub arm assembly tab ❿ into the ⓑ part.
7) Install the stopper washer ❶.

Note:
- Take care not to grease the screw ⓫ of the TG-7 arm assembly ❻ (See Fig. A).
- When fitting the pinch arm assembly ❷ to the axle ❾, make sure that it does not touch the TG-7 guide ⓬ or the rubber roller ⓭.
- After assembling, be sure to perform tape path adjustment as described in section 4.

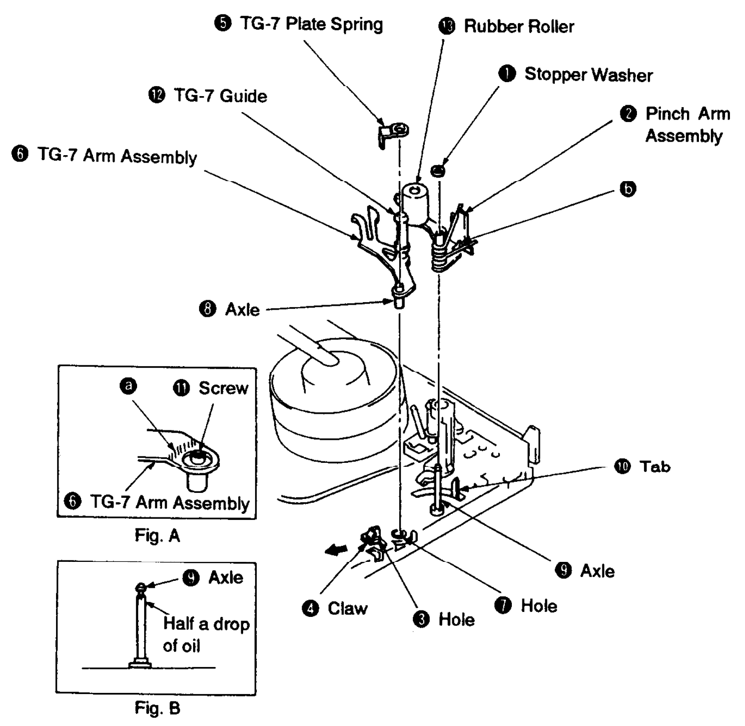

❺ TG-7 Plate Spring
⓭ Rubber Roller
❶ Stopper Washer
⓬ TG-7 Guide
❷ Pinch Arm Assembly
❻ TG-7 Arm Assembly
ⓑ
❽ Axle
ⓐ
⓫ Screw
❻ TG-7 Arm Assembly
❿ Tab
❾ Axle
Half a drop of oil
❾ Axle
❹ Claw
❸ Hole
❼ Hole

Fig. A

Fig. B

Fig. 3-8.

3-9. TG-2 ASSEMBLY

1. Removal (See Fig. 3-9.)

1) Remove the TG-2 upper flange assembly ❶.
2) Remove the TG-2 roller ❷, the TG-2 sleeve ❸, the TG-2 lower flange ❹ and the compression spring ❺.

2. Installation (See Fig. 3-9.)

1) Mount the compression spring ❺, the TG-2 lower flange ❹, the TG-2 sleeve ❸ and the TG-2 roller ❷ to the axle.
2) Secure the TG-2 upper flange ❶ to the axle by rotating it 4 to 6 turns.

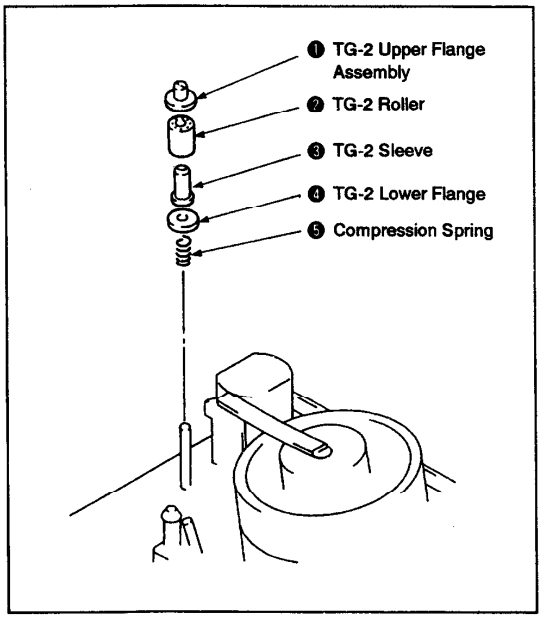

❶ TG-2 Upper Flange Assembly
❷ TG-2 Roller
❸ TG-2 Sleeve
❹ TG-2 Lower Flange
❺ Compression Spring

Fig. 3-9.

3. TG-2 Height Preset (see Fig. 3-10.)

1) Adjust height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by turning the TG-2 upper flange ❶.

Note: After adjustment, be sure to perform tape path adjustment as described in section 4.

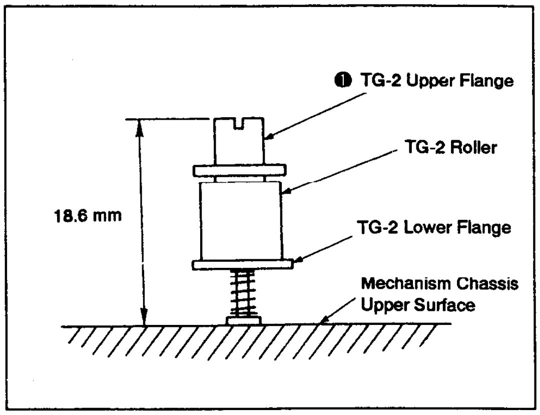

❶ TG-2 Upper Flange
TG-2 Roller
18.6 mm
TG-2 Lower Flange
Mechanism Chassis Upper Surface

Fig. 3-10.

3-10. S REEL TABLE ASSEMBLY, T REEL TABLE ASSEMBLY

1. Removal (See Fig. 3-11.)

1) Remove the S brake and T brake as described in section 3-4.
2) Remove the TL holding plate as described in section 3-5.
3) Remove the tension regulator band assembly as described in section 3-11.
4) Remove the S reel table assembly ❶.
5) Turn the stopper ❷ approx. 90 ° in the direction of the arrow Ⓐ.
6) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, remove the T reel table assembly ❹.

2. Installation (See Fig. 3-11.)

1) Apply half a drop of oil to the axle ❺ (See Fig. A).
2) Move the RK gear ❻ in the direction of the arrow Ⓒ and the TS brake ❼ in the direction of the arrow Ⓓ, putting them out of the way.
3) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, mount the T reel table assembly ❹ onto the axle ❺, then turn the stopper ❷ in the direction of the arrow Ⓔ as far as it will go.
4) Apply half a drop of oil to the axle ❽ (See Fig. B).
5) Move the RK gear ❻ in the direction of the arrow Ⓕ, the UL brake ❾ in the direction of the arrow Ⓖ and the LB brake ❿ in the direction of the arrow Ⓗ, putting them out of the way.
6) Mount the S reel table ❶ onto the axle ❽.
7) Mount the tension regulator band assembly as described in section 3-11.
8) Mount the TL holding plate as described in section 3-5.
9) Mount the S brake and T brake assemblies as described in section 3-4.

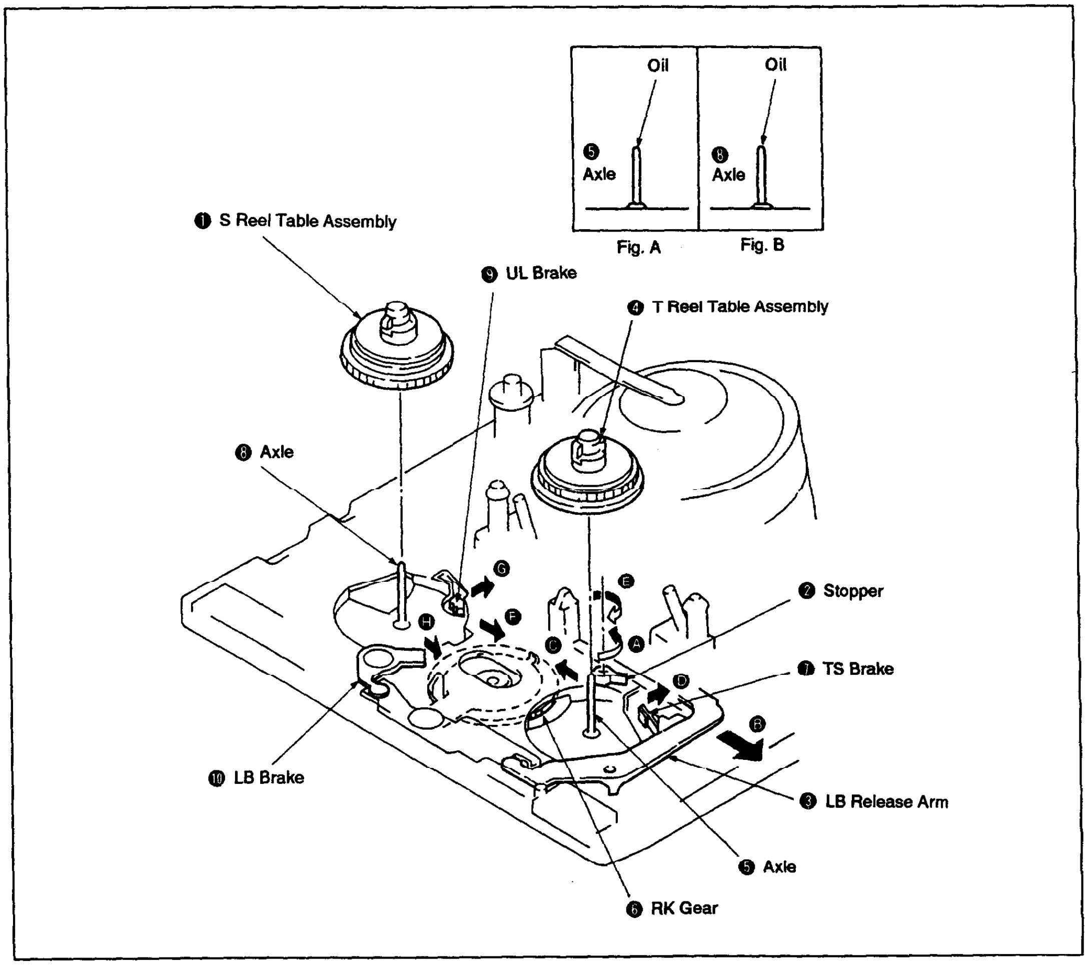

Oil
Oil
❺ Axle
❽ Axle
Fig. A
Fig. B
❶ S Reel Table Assembly
❾ UL Brake
❹ T Reel Table Assembly
❽ Axle
Ⓖ
Ⓔ
❷ Stopper
Ⓗ
Ⓕ
Ⓒ
Ⓐ
Ⓓ
❼ TS Brake
Ⓑ
❿ LB Brake
❸ LB Release Arm
❺ Axle
❻ RK Gear

Fig. 3-11.

3-11. TENSION REGULATOR BAND ASSEMBLY, TENSION REGULATOR ARM ASSEMBLY

1. Removal (See Fig. 3-12.)

1) Remove the TL holding plate as described in section 3-5.
2) Remove the screw ❶.
3) Using a thin screwdriver or the like, remove the tension regulator band assembly ❹ from the axle ❸ of tension regulator arm assembly ❷.
4) Remove the tension spring ❺.
5) Remove the stopper washer ❻ from the back of the mechanism chassis, then remove the tension regulator arm assembly ❷.
6) Open the claw ❼, then remove the adjust arm ❽.

Note: When removing the tension regulator band assembly ❹, take care not to twist or bend it, and not to touch the felt surface ❾.

2. Installation (See Fig. 3-12.)

1) Engage the adjust arm ❽ in the position shown in Fig. A, then close the claw ❼.
2) Apply half a drop of oil to the hole ❿.
3) Mount the tension regulator arm assembly ❷, then insert it into the slot ⓫ so that the ⓐ part comes to the arrow Ⓐ side of the switch lever assembly (See Fig. B).
4) While holding the tension regulator arm assembly ❷ from the mechanism chassis front, secure it with the stopper washer ❻ from the back.
5) Hook the R hook of the tension spring ❻ to the adjust arm ❽ as shown in the figure, then hook the opposite end to the tension regulator arm assembly ❷.
6) Mount the tension regulator band assembly ❹ onto the axle ❸ of tension regulator arm assembly ❷, and place it so that the felt surface ❾ comes against the shaded portion of the S reel table assembly ⓬.
7) Mount the tension regulator plate ⓭ of the tension regulator band assembly ❹ so that it is aligned with the dowel ⓮ of the mechanism chassis, then secure it temporarily with the screw ❶.
8) Mount the TL holding plate as described in section 3-5.
9) Adjust tension regulator FWD position as described in section 3-12.
10) Perform adjust arm adjustment as described in section 3-22.

Note: When mounting the tension regulator band assembly ❷, take care not to twist or bend it, and not to touch the felt surface ❾.

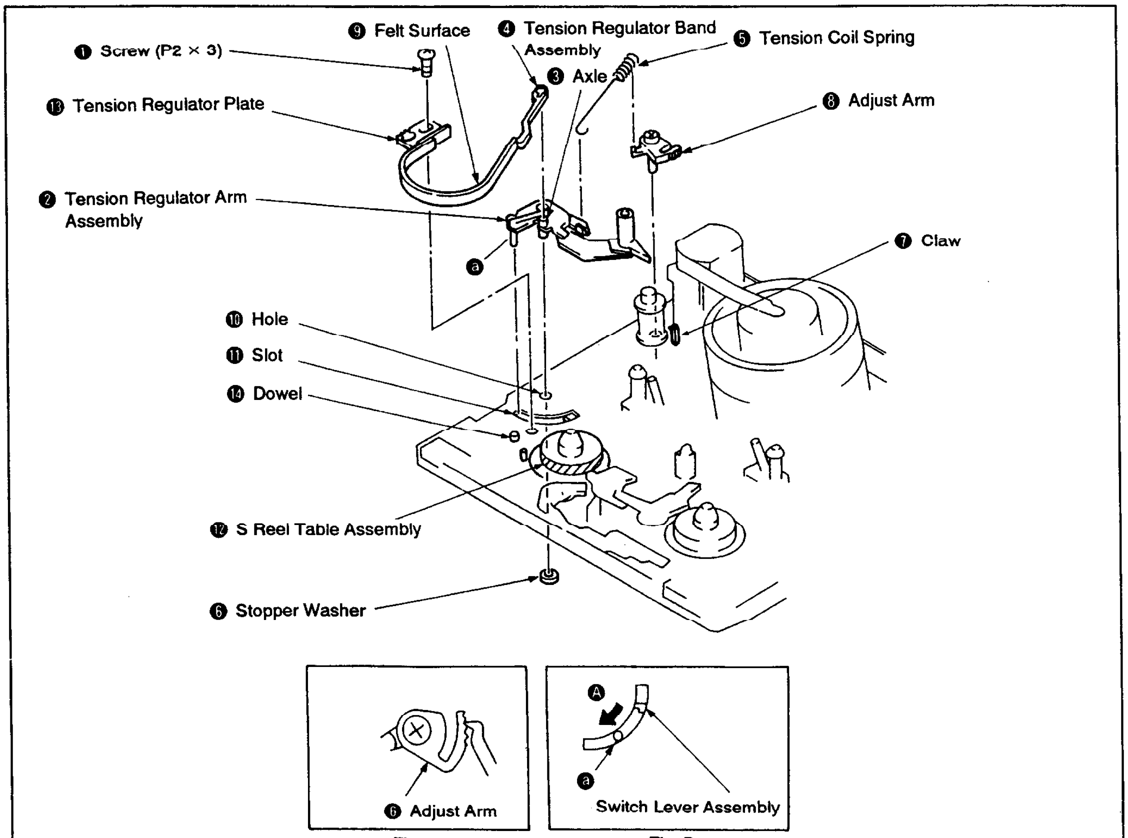

❶ Screw (P2 × 3)
❾ Felt Surface
❹ Tension Regulator Band Assembly
❸ Axle
❺ Tension Coil Spring
⓭ Tension Regulator Plate
❽ Adjust Arm
❷ Tension Regulator Arm Assembly
ⓐ
❼ Claw
❿ Hole
⓫ Slot
⓮ Dowel
⓬ S Reel Table Assembly
❻ Stopper Washer
❻ Adjust Arm
Ⓐ
ⓐ
Switch Lever Assembly

Fig. A

Fig. B

Fig. 3-12.

3-12. TENSION REGULATOR FWD POSITION PRESET (See Fig. 3-13.)

1) Load a cassette tape and set the FWD mode.
2) Confirm whether the distance between ⓐ part of the tension regulator arm ❶ and the groove ❷ of the chassis is 1.1 ± 0.3 mm. If this distance is not within the specified range, remove the cassette tape and perform the following adjustment.
3) Loosen the fixing screw ❹ of the tension regulator band assembly ❸.
4) Slide the tension regulator plate ❺ in the direction of the arrow Ⓐ if the measured distance is over the specified range, and in the direction of the arrow Ⓑ if it is under that range. Then, fix it with the screw ❹.
5) Repeat steps 1) and 2) and confirm that the distance is within the specified range.

Note: Use a cassette with the tape advanced halfway.

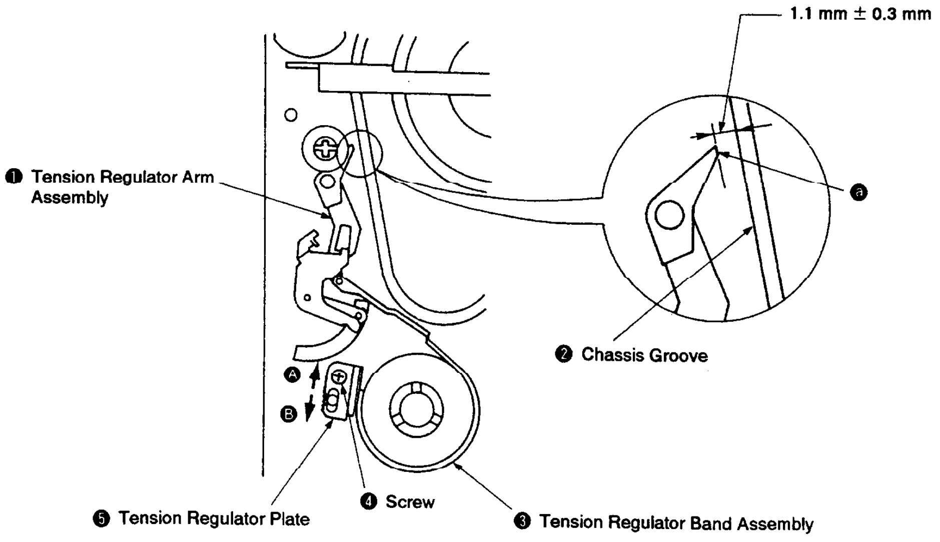

1.1 mm ± 0.3 mm
❶ Tension Regulator Arm Assembly
ⓐ
❷ Chassis Groove
Ⓐ
Ⓑ
❹ Screw
❺ Tension Regulator Plate
❸ Tension Regulator Band Assembly

Fig. 3-13.

3-13. DRUM ASSEMBLY, DEW SENSOR

1. Removal (See Fig. 3-14.)

1) Set the EJECT mode.
2) Remove the flexible board ❶ and the two connectors ❷.
3) Remove the guide guard assembly as described in section 3-2.
4) Remove the screw ❸, then remove the axle ground terminal ❹.
5) Remove the three screws ❺, then remove the drum assembly ❻ from the mechanism chassis.
6) Remove the connector ❿
7) Remove the screw ❼, then remove the dew sensor ❽.

Note:
- When removing the drum assembly ❻ from the mechanism chassis, take care not to cut the flexible board ❶ or the harness.
- Take care not to touch the head tip ❾.

2. Installation (See Fig. 3-14.)

1) Insert part ⓐ of the dew sensor ❽ into the notch ⓫ of the mechanism chassis, then secure it with the screw ❼.
2) Mount the connector ❿.
3) Clamp the harness ⓯ of the dew sensor ❽ with the reinforcing the claw ⓰ of the plate SS assembly (See Fig. A).
4) Insert the connector ❷ and the flexible board ❶ into the hole ⓬ of the mechanism chassis, align the drum assembly ❻ with the two dowels ⓭ and secure it with the three screws ❺.
5) Align the axle ground terminal ❷ with the two dowels ⓮ of the mechanism chassis and secure it with the screw ❸.
6) Mount the guide guard assembly as described in section 3-2.
7) Mount the two connectors ❷ and the flexible board ❶.

Note:
- Take care not to cut the flexible board ❶ or the harness ⓯.
- Take care not to touch the head tip ❾.
- After assembling, be sure to perform Tape Path Adjustment following instructions in section 4.

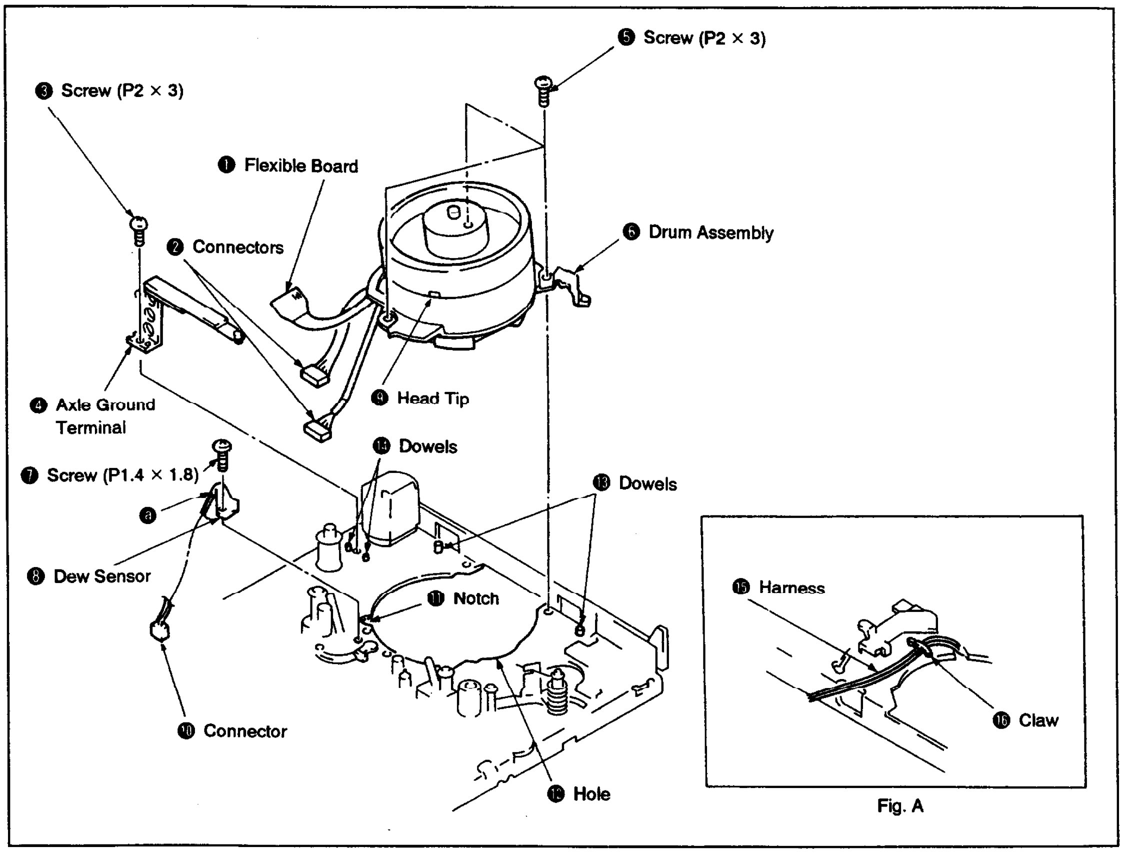

❺ Screw (P2 × 3)
❸ Screw (P2 × 3)
❶ Flexible Board
❷ Connectors
❻ Drum Assembly
❹ Axle Ground Terminal
❾ Head Tip
⓮ Dowels
❼ Screw (P1.4 × 1.8)
⓭ Dowels
ⓐ
❽ Dew Sensor
⓫ Notch
⓯ Harness
⓰ Claw
❿ Connector
⓬ Hole
Fig. A

Fig. 3-14.

3-14. EJECT LEVER, SWITCH LEVER ASSEMBLY, PINCH ROLLER SUB ARM ASSEMBLY

1. Removal (See Fig. 3-15.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Set the STOP mode.
3) Remove the claw ①, then remove the eject lever ②.
4) Remove the stopper washer ③, then remove the switch lever assembly ④.
5) Remove the pinch roller load spring ⑤.
6) Remove the stopper washer ⑥, then remove the pinch roller sub arm assembly ⑦.

2. Installation (See Fig. 3-15.)

1) Grease the axle ⑧ (See Fig. A).
2) Assemble by inserting ⓐ part of the pinch roller sub arm assembly ⑦ into the slot ⑨, then insert the pin ⑩ into the loading lever assembly notch ⑪.
3) Secure with the stopper washer ⑥.
4) Mount the pinch roller load spring ⑤ by catching its ⓑ end between the claw ⑫ and the chassis side and its ⓒ end to the claw ⑫.
5) Apply half a drop of oil to the axle ⑬ (See Fig. B).
6) Align the groove ⑭ of the switch lever assembly ④ with the mode detector switch protrusion ⑮, mount it on the axle ⑬, then insert the pin ⑯ into the drive gear (left) assembly ⑰ outer groove.
7) Secure with the stopper washer ③.
8) Mount the eject lever ② and close the claw ①.
9) Mount the DC motor (capstan motor) as described in section 3-3.

Note: When mounting the switch lever assembly ④ onto the axle ⑬ with the tension regulator arm assembly installed, set the pin ⑯ to the arrow Ⓐ side of the switch lever assembly ④.

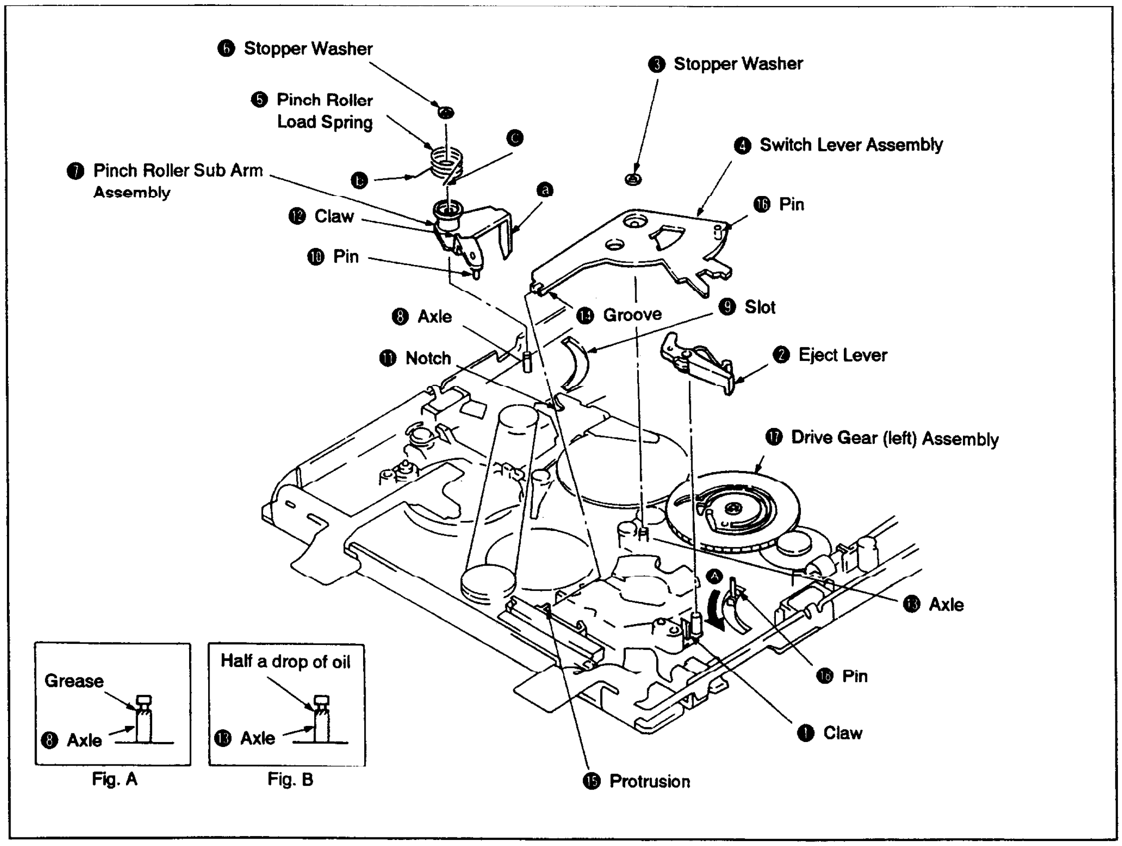

⑥ Stopper Washer
⑤ Pinch Roller Load Spring
⑦ Pinch Roller Sub Arm Assembly
ⓑ
ⓒ
ⓐ
⑫ Claw
⑩ Pin
⑧ Axle
⑪ Notch
③ Stopper Washer
④ Switch Lever Assembly
⑯ Pin
⑭ Groove
⑨ Slot
② Eject Lever
⑰ Drive Gear (left) Assembly
Ⓐ
⑬ Axle
⑯ Pin
① Claw
⑮ Protrusion
Grease
⑧ Axle
Half a drop of oil
⑬ Axle

Fig. A

Fig. B

Fig. 3-15.

3-15. TIMING BELT (L) , RC GEAR ASSEMBLY, LOADING LEVER ASSEMBLY, TIMING BELT (S), CONNECTING GEAR ASSEMBLY

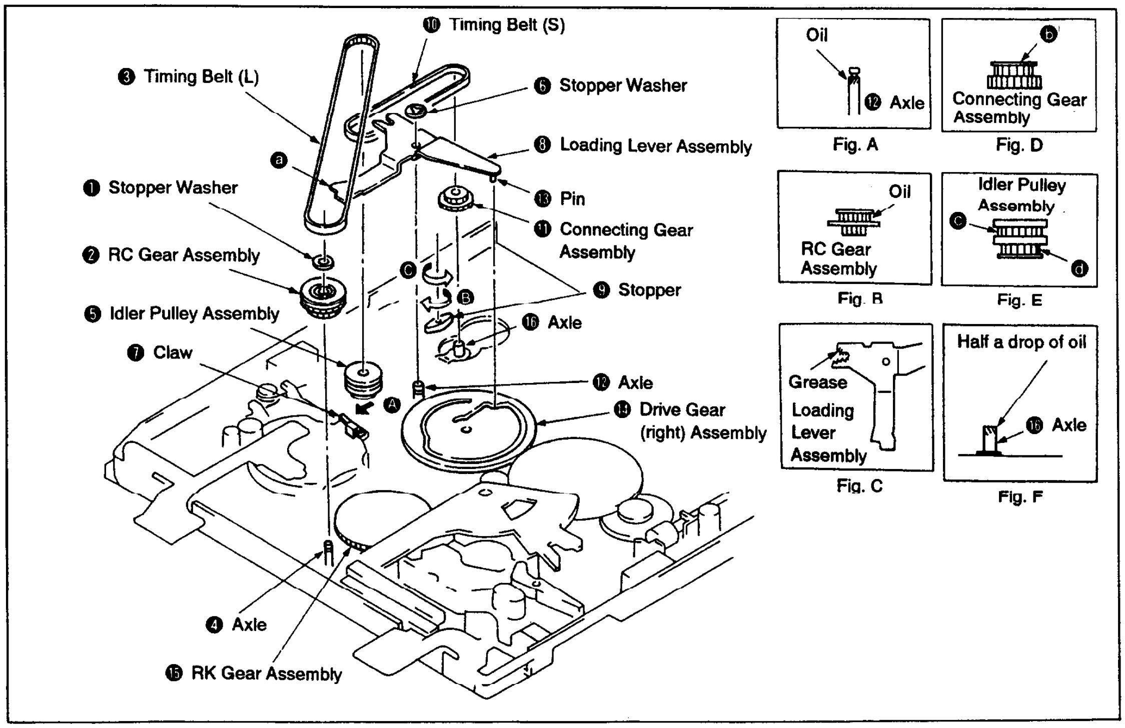
1. Removal (See Fig. 3-16.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the pinch roller sub arm assembly as described in section 3-14.
3) Set the STOP mode.
4) Remove the stopper washer ❶ , then remove the RC gear assembly ❷ from the axle ❹ with the timing belt (L) ❸ attached.
5) Remove the timing belt (L) ❸ from the idler pulley assembly ❺.
6) Remove the stopper washer ❻ and remove the loading lever assembly ❽ while pushing the claw ❼ in the direction of the arrow Ⓐ.
7) Turn the stopper ❾ approx. 90 ° in the direction of the arrow Ⓑ.
8) Remove the connecting gear assembly ⓫ from the axle ⓰ with the timing belt (S) ❿ attached.
9) Remove the timing belt (S) ❿ from the idler pulley assembly ❺.

Note: When removing the connecting gear ⓫ , take care not touch the flange section ⓑ.

2. Installation (See Fig. 3-16.)

1) Apply half a drop of oil to the axle ⓰ (See Fig. F).
2) Hook one end of the timing belt (S) ❿ onto the connecting gear assembly ⓫ and the other end onto gear ⓓ of the idler pulley assembly ❺. (Refer to the figure.)
3) Mount the connecting gear assembly ⓫ with the timing belt (S) ❿ attached to the axle ⓰.
4) Turn the stopper ❾ in the direction of the arrow Ⓒ as far as it will go.
5) Apply half a drop of oil to the axle ⓬ (See Fig. A).
6) Fit the loading lever assembly ❽ to the axle ⓬, secure the ⓐ part with the claw ❼ and place the pin ⓭ into the groove of the drive gear (right) assembly ⓮.
7) Install the stopper washer ❻.
8) Place the timing belt (L) ❸ around the gears of the RC gear assembly ❷ indicated in Fig. B, and its opposite side around the gear ⓒ of the idler pulley assembly ❺. (See Fig. E.)
9) Mount the RC gear assembly ❷ onto the axle ❹ with the timing belt (L) ❸ attached, and engage it with the gear of the RK gear assembly ⓯.
10) Install the stopper washer ❶.
11) Grease parts of the loading lever assembly ❽ indicated in Fig. C.
12) Mount the pinch roller sub arm assembly as described in section 3-14.
13) Mount the DC motor (capstan motor) as described in section 3-3.



❿ Timing Belt (S)
❸ Timing Belt (L)
❻ Stopper Washer
ⓐ
❽ Loading Lever Assembly
❶ Stopper Washer
⓭ Pin
⓫ Connecting Gear Assembly
❷ RC Gear Assembly
Ⓒ
Ⓑ
❾ Stopper
❺ Idler Pulley Assembly
⓰ Axle
❼ Claw
⓬ Axle
Ⓐ
⓮ Drive Gear (right) Assembly
❹ Axle
⓯ RK Gear Assembly
Oil
⓬ Axle
Fig. A
ⓑ
Connecting Gear Assembly
Fig. D
Oil
RC Gear Assembly
Fig. B
Idler Pulley Assembly
ⓒ
ⓓ
Fig. E
Grease
Loading Lever Assembly
Fig. C
Half a drop of oil
⓰ Axle
Fig. F

Fig. 3-16.

3-16. IDLER PULLEY, TS BRAKE ASSEMBLY, LB GEAR ASSEMBLY, RK GEAR ASSEMBLY

1. Removal (See Fig. 3-17.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly described in section 3-15.
4) Set the STOP mode.
5) Remove the stopper washer ❶, then remove the idler pulley ❷.
6) Open the claw ❸, then remove the TS brake assembly ❹.
7) Remove the torsion coil spring (LB) ❺.
8) Remove the stopper washer ❻, then remove the LB gear assembly ❼.
9) Remove the RK gear assembly ❽.

Note: When removing the idler pulley ❷, take care not to touch the flange section ⓐ. (See Fig. C.)

2. Installation (See Fig. 3-17.)

1) Apply half a drop of oil to the axle ❾ (See Fig. A).
2) Mount the RK gear assembly ❽ onto the axle ❾, keeping it in horizontal position.
3) Apply half a drop of oil to the axle ❿ (See Fig. B).
4) Mount the LB gear assembly ❼ onto the axle ❿ and secure it with the stopper washer ❻.
5) Insert the torsion coil spring (LB) ❺ into the axle ⓫, then hook it to the mechanism chassis notch ⓬ and to the tab ⓭.
6) Mount the TS brake assembly ❹ and close the claw ❸.
7) Apply half a drop of oil to the axle ⓰ (See Fig. D).
8) Mount the idler pulley ❷ onto the axle ⓰, then secure it with the stopper washer ❶.
9) Mount the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly as described in section 3-15.
10) Mount the switch lever assembly as described in section 3-14.
11) Mount the DC motor (capstan motor) as described in section 3-3.

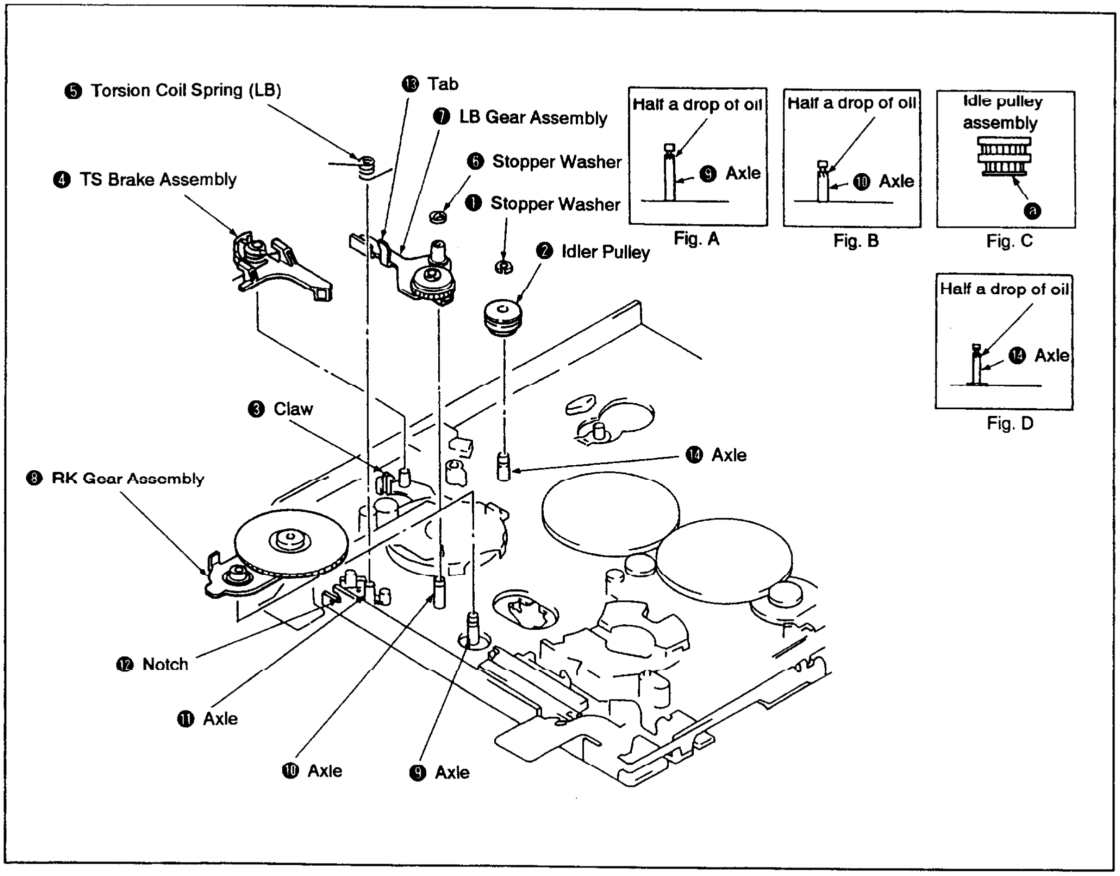

❺ Torsion Coil Spring (LB)
⓭ Tab
❼ LB Gear Assembly
❻ Stopper Washer
❹ TS Brake Assembly
❶ Stopper Washer
❷ Idler Pulley
Half a drop of oil
❾ Axle
Fig. A
Half a drop of oil
❿ Axle
Fig. B
Idle pulley assembly
ⓐ
Fig. C
Half a drop of oil
⓮ Axle
Fig. D
❸ Claw
⓮ Axle
❽ RK Gear Assembly
⓬ Notch
⓫ Axle
❿ Axle
❾ Axle

Fig. 3-17.

3-17. UL GEAR, UL BRAKE, UL ARM, LB PLATE SPRING

1. Removal (See Fig. 3-18.)

1) Remove the switch lever assembly as described in section 3-14.
2) Remove the stopper washer ❶, then remove the UL gear ❷.
3) Remove the UL arm ❸, the 1.6 mm-diameter poly washer ❹ and the LB plate spring ❺.
4) Remove the UL brake ❻.

2. Installation (See Fig. 3-18.)

1) Mount the UL brake ❻.
2) Apply half a drop of oil to the axle ❼ (See Fig. A).
3) Mount the LB plate spring ❺ to the axle ❼ as shown in Fig. B, then install the 1.6mm-diameter poly washer ❹.
4) Mount the UL arm ❸ to the axle ❼ so that the protrusion ❽ comes into the groove ❾ of the UL brake ❻.
5) Mount the UL gear ❷ to the axle ❼ and engage it with the gear of the drive gear (left) assembly ❿.
6) Install the stopper washer ❶.
7) Mount the switch lever assembly as described in section 3-14.

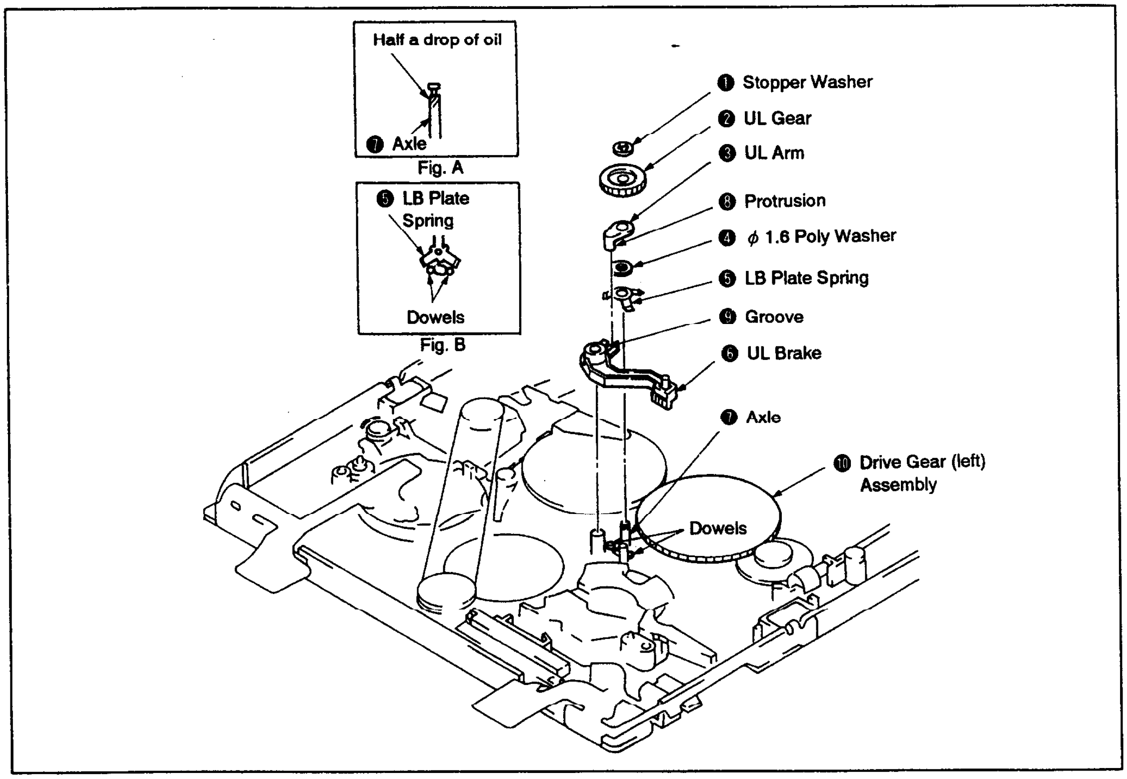

Half a drop of oil
❼ Axle
Fig. A
❺ LB Plate Spring
Dowels
Fig. B
❶ Stopper Washer
❷ UL Gear
❸ UL Arm
❽ Protrusion
❹ ϕ 1.6 Poly Washer
❺ LB Plate Spring
❾ Groove
❻ UL Brake
❼ Axle
❿ Drive Gear (left) Assembly
Dowels

Fig. 3-18.

3-18. COASTER (RIGHT) ASSEMBLY, DRIVE GEAR (RIGHT) ASSEMBLY

1. Removal (See Fig. 3-19.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum unit as described in section 3-13.
3) Remove the switch lever assembly as described in section 3-14.
4) Remove the timing belt (L) , the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Set the STOP mode.
6) Remove the screw ❶ , then remove the coaster plate spring ❷ and the coaster (right) assembly ❸ .
7) Remove the two screws ❹ , then remove the reinforcing plate TT ❺ .
8) Remove the stopper washer 1.5 ❻ , then remove the drive gear (right) assembly ❼ .

2. Installation (See Fig. 3-19.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ❽ (See Fig. F).
3) Grease pin ❾ , axle ❿ and dowel ⓮ of the coaster (right) assembly ❸ (See Fig. D).
4) Mount by aligning the pin ❾ and the axle ❿ with the slot ⓫ of the mechanism chassis.
5) Move the brake release arm ⓬ in the direction of the arrow Ⓐ to put it out of the way.
6) Mount the drive gear (right) assembly ❼ to the axle ❽ , and engage it with the drive gear (left) assembly ⓭ as shown in Fig. B.
7) Align the ⓐ part with the ⓑ part, and the hole ⓮ with the pin ❾ of the coaster (right) assembly ❸ .
8) Install the stopper washer 1.5 ❻ .
9) Mount by aligning the coaster plate spring ❷ with the axle ❿ of the coaster (right) assembly ❸ and pin ❾ , then secure with the screw ❶ .
10) Mount the reinforcing plate TT ❺ aligning it with the dowel ⓯, then tighten the two screws ❹ in the indicated order.
11) Grease the points indicated in Figs. C and E.
12) Mount the timing belt (L) , the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly as described in section 3-14.
14) Mount the drum unit as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ❶ should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ❸ and the coaster plate spring ❷ will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

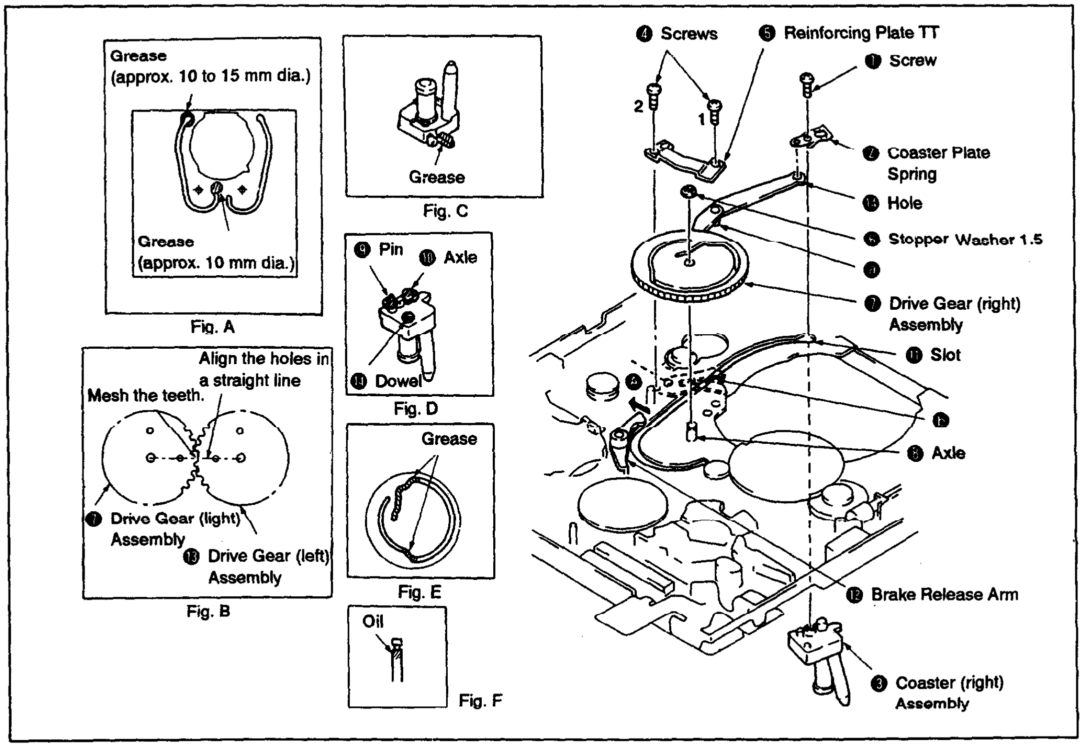

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
Align the holes in a straight line
Mesh the teeth.
❼ Drive Gear (light) Assembly
⓭ Drive Gear (left) Assembly
Grease
❾ Pin
❿ Axle
⓮ Dowel
Grease
Oil
❹ Screws
❺ Reinforcing Plate TT
❶ Screw
2
1
❷ Coaster Plate Spring
⓮ Hole
❻ Stopper Washer 1.5
ⓐ
❼ Drive Gear (right) Assembly
⓫ Slot
Ⓐ
ⓑ
❽ Axle
⓬ Brake Release Arm
❸ Coaster (right) Assembly

Fig. A

Fig. B

Fig. C

Fig. D

Fig. E

Fig. F

Fig. 3-19.

3-19. COASTER (LEFT) ASSEMBLY, DRIVE GEAR (LEFT) ASSEMBLY

1. Removal (See Fig. 3-20.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum assembly as described in section 3-13.
3) Remove the switch lever assembly and the pinch roller sub-arm assembly as described in section 3-14.
4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Remove the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
6) Remove the screw ❶, then remove the coaster plate spring ❷ and the coaster (left) assembly ❸.
7) Remove the two screws ❹ , then remove the reinforcing plate SS assembly ❺.
8) Remove the stopper washer 1.5 ❻, then remove the drive gear (left) assembly ❼.

2. Installation (See Fig. 3-20.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ❽ (See Fig. E).
3) Grease pin ❾, axle ❿ and dowel ⓰ of the coaster (left) assembly ❸ (See Fig. B).
4) Mount by aligning the pin ❾ and the axle ❿ with the slot ⓫ of the mechanism chassis.
5) Fit the drive gear (left) assembly ❼ to the axle ❽, and mount so that the gear engages with the wheel gear ⓭ and the UL gear ⓮.
6) Align the 🅐 part with the slot ⓫, and the hole ⓮ with the pin ❾ of the coaster (left) assembly ❸.
7) Install the stopper washer 1.5 ❻.
8) Mount by aligning the coaster plate spring ❷ with the axle ❿ and pin ❾ of the coaster (left) assembly ❸, then secure with the screw ❶.
9) Mount the reinforcing plate SS assembly ❺ aligning it with the dowel ⓯, then tighten the two screws ❹ in the indicated order.
10) Grease points indicated in Figs. C and D.
11) Mount the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
14) Mount the drum assembly as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ❶ should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ❸ and the coaster plate spring ❷ will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

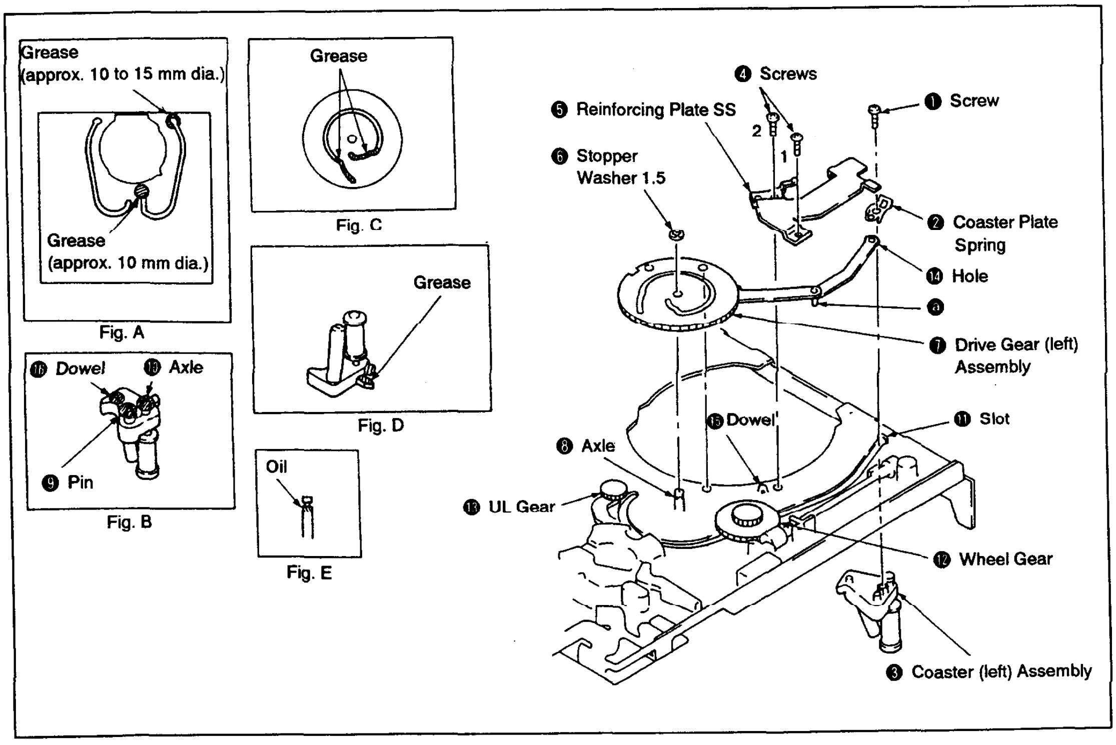

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
Fig. A
⓰ Dowel
⓾ Axle
❾ Pin
Fig. B
Grease
Fig. C
Grease
Fig. D
Oil
Fig. E
❹ Screws
❺ Reinforcing Plate SS
2
1
❻ Stopper Washer 1.5
❶ Screw
❷ Coaster Plate Spring
⓮ Hole
🅐
❼ Drive Gear (left) Assembly
⓫ Slot
⓯ Dowel
❽ Axle
⓭ UL Gear
⓬ Wheel Gear
❸ Coaster (left) Assembly

Fig. 3-20.

3-20. LOADING MOTOR, BRAKE RELEASE ARM, WHEEL GEAR, WORM ASSEMBLY

1. Removal (See Fig. 3-21.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
4) Remove the drive gear (right) assembly as described in section 3-18.
5) Remove the drive gear (left) assembly as described in section 3-19.
6) Remove the two screws ❶, then remove the loading motor assembly ❷.
7) Remove the brake release arm ❸.
8) Remove the stopper washer ❹, then remove the wheel gear ❺.
9) Remove the worm assembly ❻ from the six claws ❼.

2. Installation (See Fig. 3-21.)

1) Mount the worm assembly ❻, matching it to the six claws ❼.
2) Grease the shaded parts of the worm assembly ❻ (five places) (see Fig A).
3) Apply half a drop of oil to the axle ❽ (See Fig. B).
4) Fit the wheel gear ❺ to the axle ❽ and engage it with the gear of the worm assembly ❻.
5) Mount the brake release arm ❸.
6) Grease the whole perimeter of the gear of the loading motor assembly ❷.
7) Align the loading motor assembly ❷ with the mechanism chassis and secure it with the two screws ❷.
8) Mount the drive gear (left) assembly as described in section 3-19.
9) Mount the drive gear (right) assembly as described in section 3-18.
10) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
11) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
12) Mount the DC motor (capstan motor) as described in section 3-3.

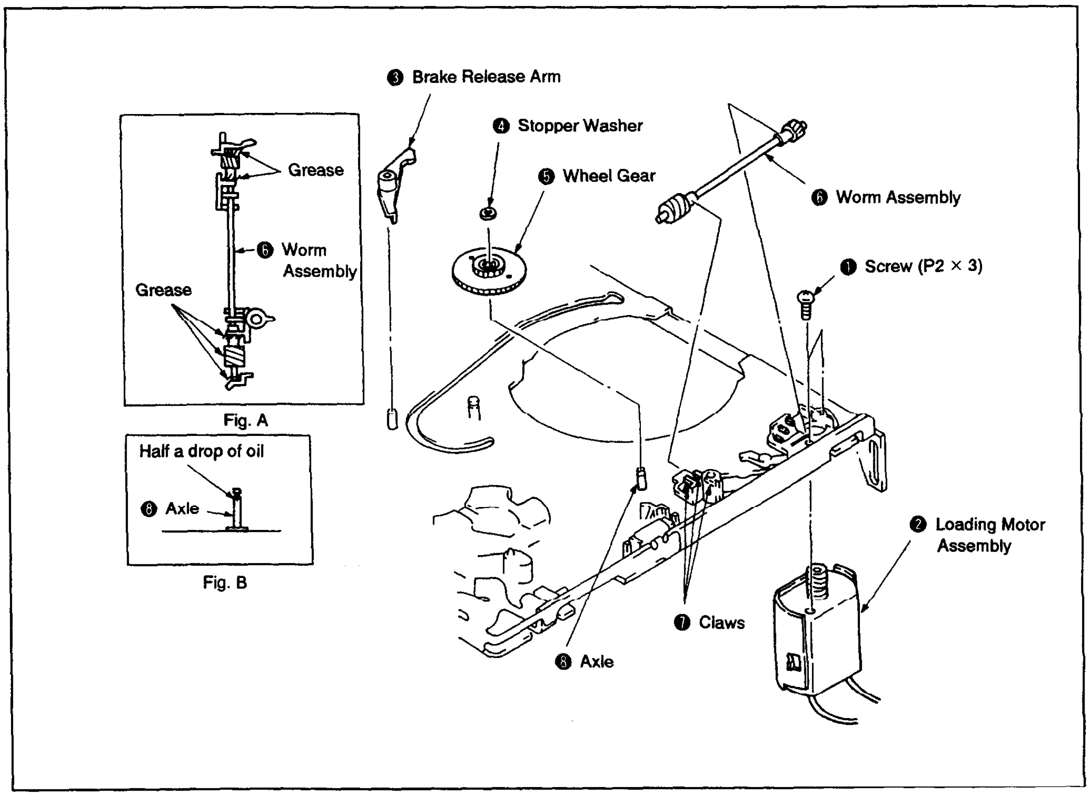


Fig. A

Fig. B

Fig. 3-21.

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removal

- If possible, make a recording before removal.

1) Detach the six solderings ⓐ, then use a pair of tweezers or the like to confirm that the terminals passing through the board holes from below can move freely.
2) Remove the two screws ❶ (See Fig. 3-22).
3) Mount the jig ❹ (Ref. No. J-7) with the two supplied screws ❷, then screw the attached hexagon socket screws ❸ to the jig ❹. The rotary upper drum ❺ will move upward and come off (See Fig. 3-23).

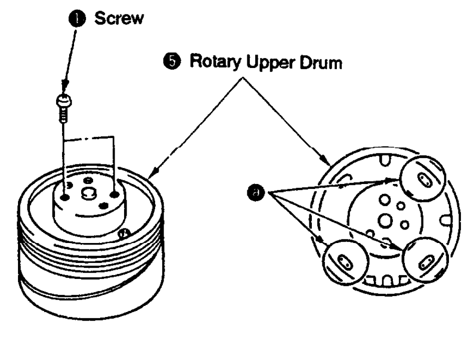


Fig. 3-22.

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ❺ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ❼ (Ref. No. J-7) into the drum positioning hole, then set the rotary upper drum ❺ by passing the jig through its positioning hole ❻.

   Note: Confirm that the terminals ❽ protrude slightly from the rotary upper drum board holes (See Fig. 3-24).
3) Remove the jig ❼ and push down the rotary upper drum ❺ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two hexagon socket screws ❶ alternately.
4) Insert the jig ❼ into the positioning hole ❻ again and confirm that it goes in smoothly. If it does not, loosen the two screws ❶, repeat step 3 of the Removal paragraph and restart the setting procedure.
5) Tighten the screws ❶.
6) Solder the terminals ❽ (ⓐ in Fig. 3-22).

   Note: Take care that no solder flows below the board.

Note: After installing, be sure to perform tape path adjustment as described in section 4.

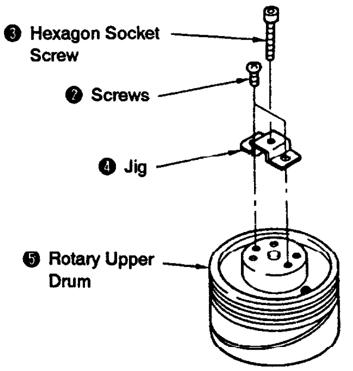


Fig. 3-23.

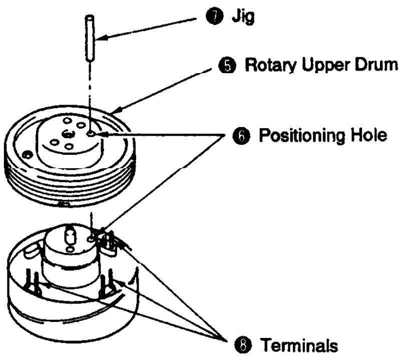


Fig. 3-24.

3-22. FWD BACK TENSION (See Fig. 3-25.)

1) Set the torque cassette (Ref. No. J-6).
2) Set the FWD mode and confirm that S reel table torque value is within 9 to 13 g•cm.
3) If the torque value does not meet the specification, adjust the adjust arm ❶.

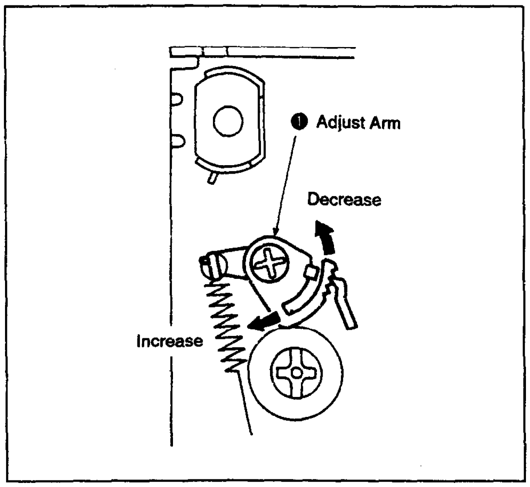


Fig. 3-25.

3-23. REEL TORQUE CHECK

1) Set the torque cassette.
2) Set the FWD mode and confirm that T reel table torque value is within 7 to 15 g•cm.
3) Set the REV mode and confirm that S reel table torque value is within 29 ± 6 g•cm.
4) Set the REV mode and confirm that T reel table torque value is within 13 to 25 g•cm.
5) If a torque value does not meet the specifications above, replace the corresponding reel table.

4. TAPE PATH ADJUSTMENT

[The Track Shift Mode]

In the 8 mm video system, instantaneous tape speed control is performed using four kinds of pilot signals, and high-precision tracking is achieved through the ATF (Automatic Track Finding) system. This makes a tracking control knob unnecessary and allows for precise tracing.

On the other hand, however, tape path adjustment presents some difficulties when the ATF system is used. Namely, since the ATF system will automatically compensate to some degree for head tracing errors, thorough adjustment is not possible.

This can be solved by setting the track shift mode for tracking fine adjustment. ATF will be compulsorily activated, shifting the tracking amount by a fixed amount (approx. 1/4) and thus making tracking fine adjustment easy. Furthermore, no track shift jigs are required.

4-1. TRACK SHIFT MODE SETTING

[Setting Procedure]

- Connect the TEST A and TEST B terminals to the COM terminal.
  Example:
  NTSC ········ GV-8
  PAL ·········· GV-8E
  Connect Pins ① and pin ③ of CN017 on the { SV-34 board (GV-8) / SV-35 board (GV-8E) } to pin ② of it. (See Fig. 4-1)

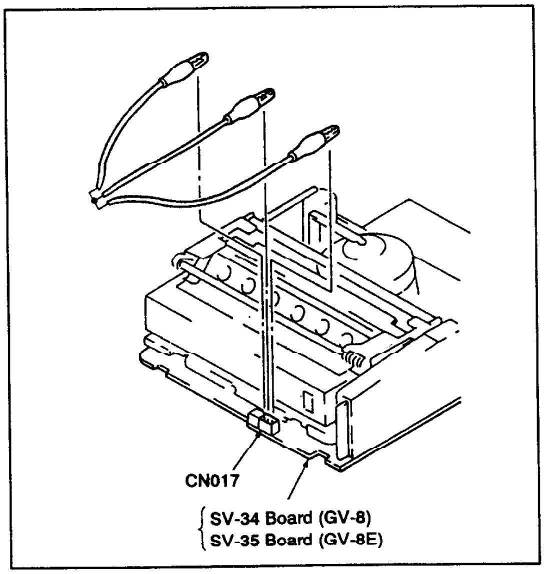
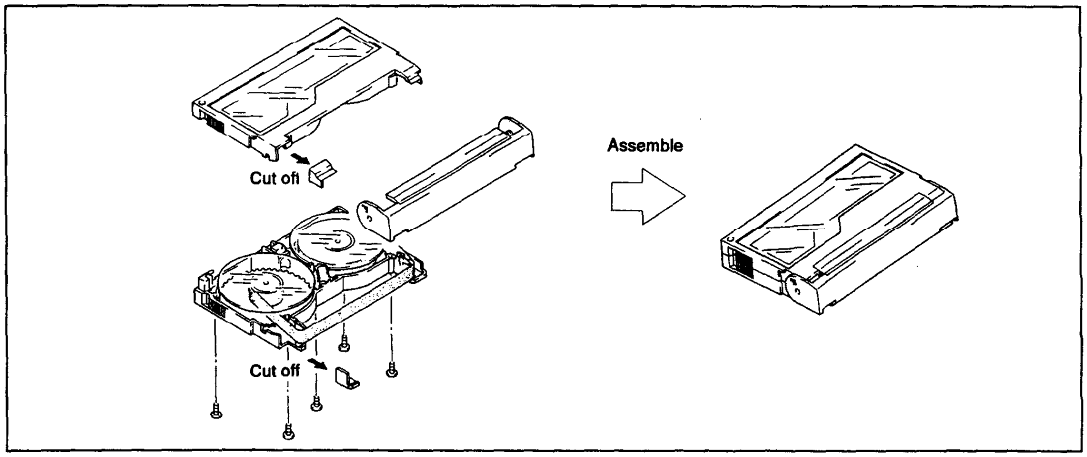


Fig. 4-1.

[Note on Adjustment of No.7 Guide (TG-7)]
The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig. 4-2).
Therefore, when performing section 4-6. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-5), modified as follows, and perform adjustment in playback mode.


Cut off
Cut off
Assemble

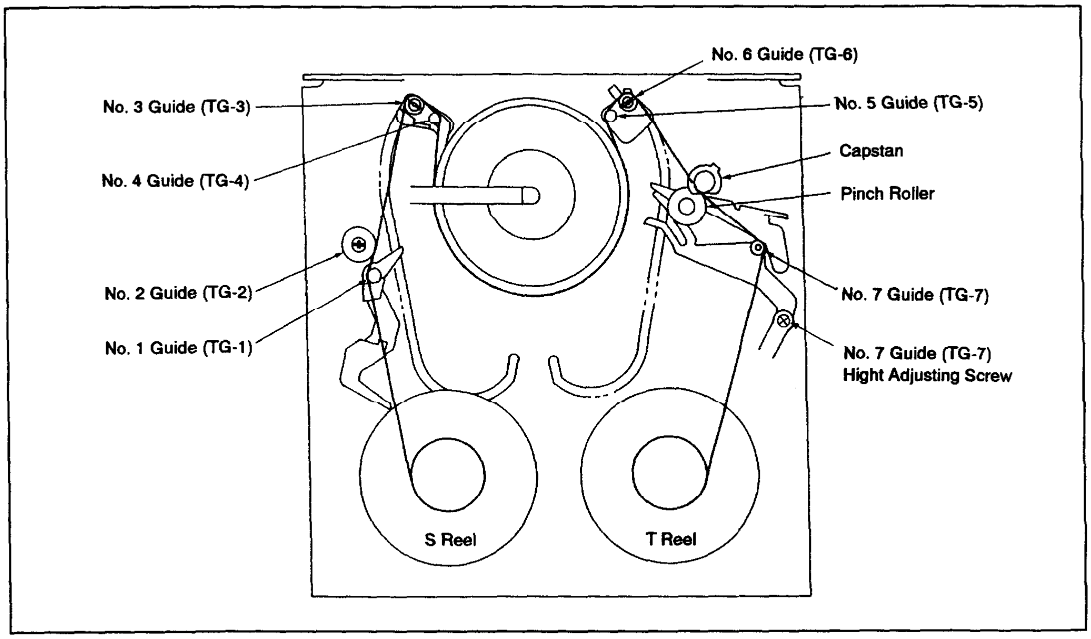

No. 6 Guide (TG-6)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
Capstan
No. 4 Guide (TG-4)
Pinch Roller
No. 2 Guide (TG-2)
No. 7 Guide (TG-7)
No. 1 Guide (TG-1)
No. 7 Guide (TG-7)
Hight Adjusting Screw
S Reel
T Reel

Fig. 4-2.

4-2. PREPARATIONS FOR ADJUSTMENT

1) Clean tape path surfaces (tape guides, drum, capstan shaft, pinch roller) (See Fig. 4-2).
2) Connection of oscilloscope and output method of waveform.
   CH 1: RF signal output of the drum head (V RF OUT)
   Method for signal output:
   Short-circuit the external trigger output (RF SW. P) and GND.

   Example:
   NTSC ····· GV-8
   PAL ······· GV-8E
   CH 1: Pin ③ (V RF OUT) of CN018 on the
   { SV-34 board (GV-8)
   { SV-35 board (GV-8E)
   Method for signal output:
   Short-circuit pin ① (GND) and pin ② (RF SW.P) of CN018 on the
   { SV-34 board (GV-8)
   { SV-35 board (GV-8E)
3) Play back the alignment tape for tracking adjustment (Ref. No. J-5).
4) Confirm that both the entrance and exit side RF waveforms of the oscilloscope are flat (See Fig. 4-4). If they are not, adjust as follows.

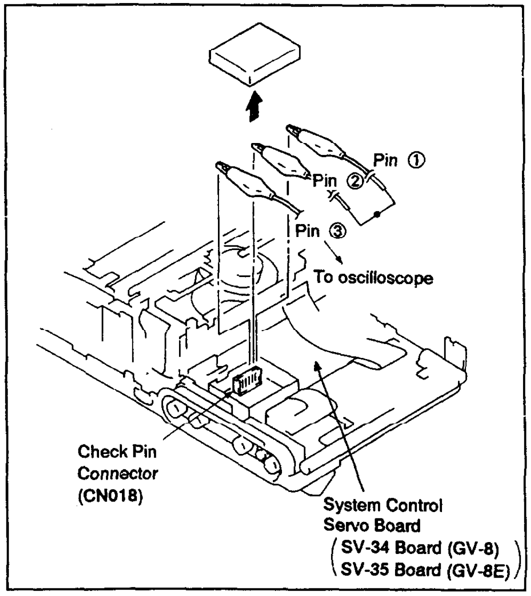

Pin ①
Pin ②
Pin ③
To oscilloscope
Check Pin Connector (CN018)
System Control Servo Board
(SV-34 Board (GV-8))
(SV-35 Board (GV-8E))

Fig. 4-3.

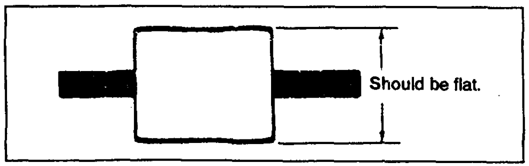

Should be flat.

Fig. 4-4.

4-3. TRACKING ADJUSTMENT (See Fig. 4-5.)

1) Play back the alignment tape for tracking adjustment.
2) Pass a hexagonal wrench, screwdriver (Ref. No. J-11) or the like through the hole ❶, loosen the lockscrew ❷ a little, then make the entrance side waveform flat by turning the No. 3 guide (TG-3) ❸.
3) Pass a hexagonal wrench, screwdriver or the like through the hole ❹, loosen the lockscrew ❺ a little, then make the exit side waveform flat by turning the No. 6 guide (TG-6) ❻.

Note: Take care not to loosen lockscrews too much, since guides come loose easily.

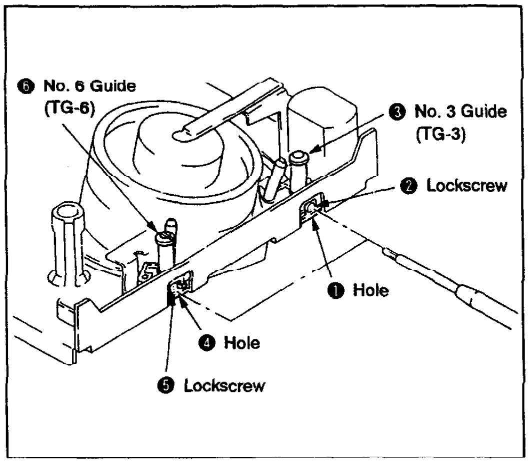

❻ No. 6 Guide (TG-6)
❸ No. 3 Guide (TG-3)
❷ Lockscrew
❶ Hole
❹ Hole
❺ Lockscrew

Fig. 4-5.

4-4. TRACKING FINE ADJUSTMENT (See Figs. 4-5. and 4-6.)

1) Play back the alignment tape for tracking adjustment and set the track shift mode.
2) Confirm whether the waveform is flat. If it is not, turn the No. 3 (TG-3) and No. 6 (TG-6) guides so that it becomes flat.
3) Fix the No. 3 guide ❸ by tightening its lockscrew ❷. Then confirm that the entrance side waveform has not changed.
4) Fix the No. 6 guide ❻ by tightening its lockscrew ❺. Then confirm that the exit side waveform has not changed.

Note: The set screws ❷ and ❺ should be tightened with a tightening torgue of approx. 200g•cm ± 10%.
If tightened too much, there is danger of damaging the thread.

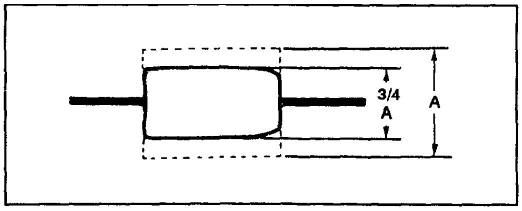


Fig. 4-6.

4-5. No. 2 GUIDE (TG-2) ADJUSTMENT

When the No. 2 guide has been turned or replaced, perform height presetting before this adjustment.

4-5-1. No. 2 Guide (TG-2) Height Presetting (See Fig. 4-7.)

1) Adjust the height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by rotating the TG-2 upper flange ❶.

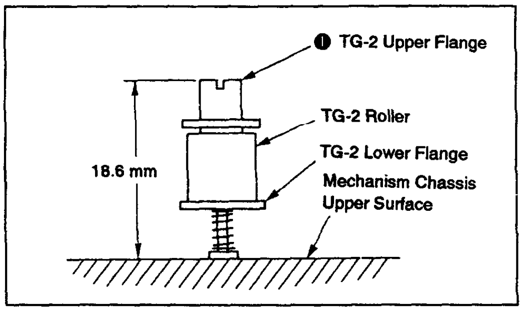


Fig. 4-7.

[Reference]

This U mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Counterclockwise
	Lower	Clockwise

4-5-2. No. 2 Guide (TG-2) Adjustment (See Figs. 4-8. and 4-9.)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ❷ of the No. 2 guide (TG-2) ❶ (See Fig. 4-8). If it is, turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and tracking fine adjustment as described in sections 4-3. and 4-4.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (See Fig. 4-9), turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ 90° counter-clockwise and repeat step 5.
   Repeat steps 5 and 6 until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step 5.

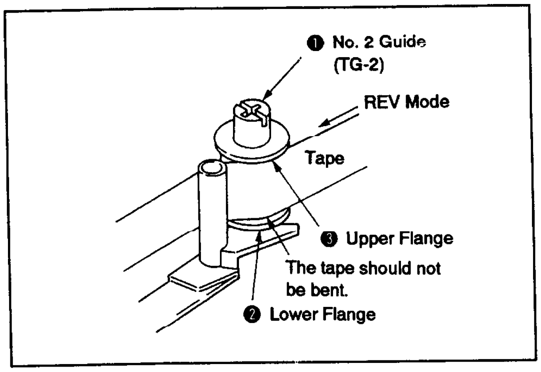

❶ No. 2 Guide (TG-2)
REV Mode
Tape
❸ Upper Flange
The tape should not be bent.
❷ Lower Flange

Fig. 4-8.

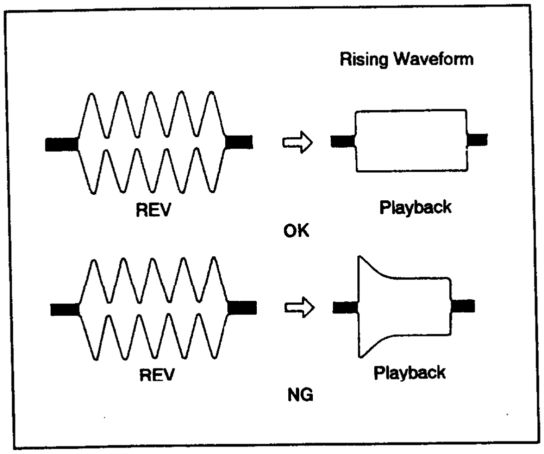

Rising Waveform
REV
OK
Playback
REV
NG
Playback

Fig. 4-9.

4-6. No. 7 GUIDE (TG-7) ADJUSTMENT (See Fig. 4-10.)

1) Play back the alignment tape for tracking adjustment and set the REV mode.
2) Confirm that the tape is not bent between the No. 6 guide (TG-6) ❶ and the capstan ❷. If it is, turn the hight adjusting screw ❹ of the No. 7 guide (TG-7) ❸ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ❷ and the hight adjusting screw ❹ of the No. 7 guide (specification:0.5 mm or less). If the tape is bent beyond the specification, turn the No. 7 guide (TG-7) ❸ until bending is within the specification (0.5 mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) ❶ and the capstan ❷ is 0.3 mm or less, adjustment can be considered completed.

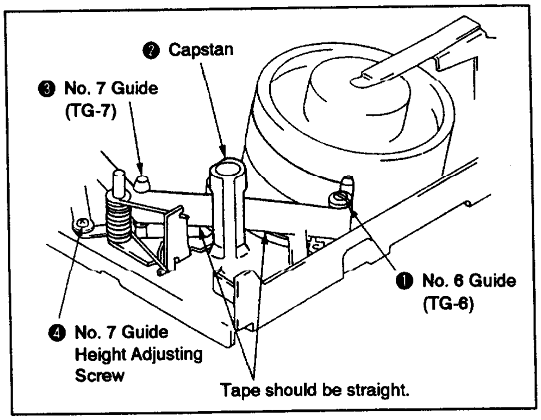

❷ Capstan
❸ No. 7 Guide (TG-7)
❶ No. 6 Guide (TG-6)
❹ No. 7 Guide Height Adjusting Screw
Tape should be straight.

Fig. 4-10.

4-7. CUE AND REV WAVEFORM CHECK (See Fig. 4-11.)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (See Fig. 4-11). In case pitch is not constant, perform section 4-4. Tracking Fine Adjustment and section 4-6. No. 7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (See Fig. 4-11). Otherwise, perform section 4-4. Tracking Fine Adjustment.

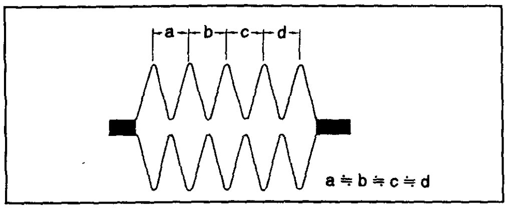


Fig. 4-11.

4-8. CHECK AFTER ADJUSTMENT

4-8-1. Tracking Check

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (See Fig. 4-12).
2) Then, confirm that the minimum amplitude value (E_{MIN}) is 65% of the maximum value (E_{MAX}) or larger (See Fig. 4-13).
3) Confirm that no large fluctuations occur on the waveform (See Fig. 4-14).

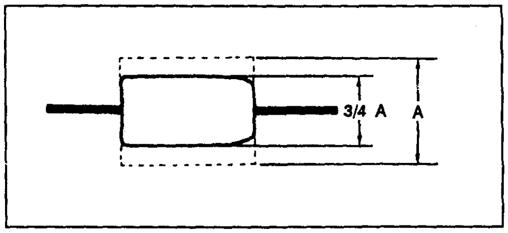


Fig. 4-12.

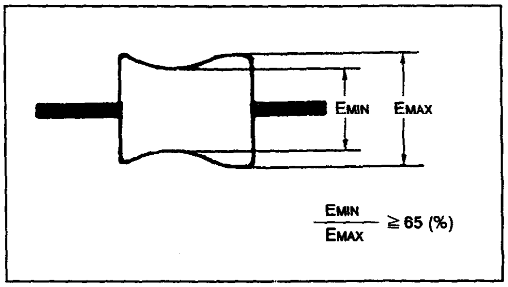


Fig. 4-13.

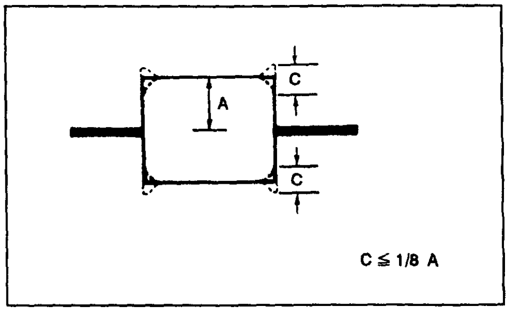


Fig. 4-14.

4-8-2. Rising Check (See Fig. 4-15.)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller (See Fig. 4-15).
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

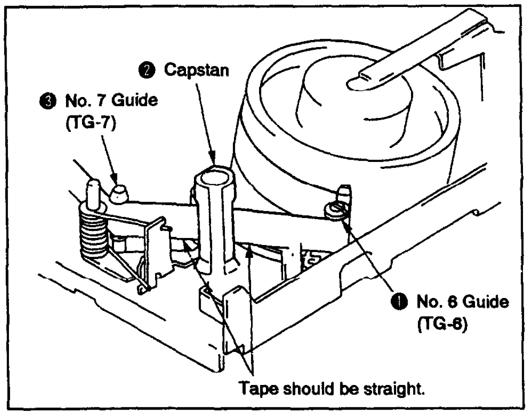

❷ Capstan
❸ No. 7 Guide (TG-7)
❶ No. 6 Guide (TG-6)
Tape should be straight.

Fig. 4-15.

4-8-3. Tape Path Check (See Fig. 4-16.)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3 mm, at the lower flange of the No. 2 guide, the upper flange of the No. 3 guide, the upper flange of the No. 6 guide and the No. 7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3 mm at the flanges of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

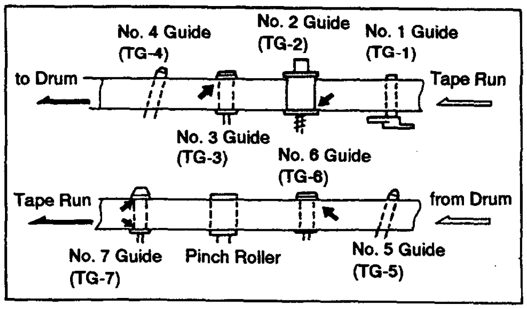

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 1 Guide (TG-1)
to Drum
Tape Run
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
Tape Run
from Drum
No. 7 Guide (TG-7)
Pinch Roller
No. 5 Guide (TG-5)

Fig. 4-16.